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# Summary of the Second National Conference on Household Hazardous Waste Management Held on November 2-4, 1987 in San Diego, California

Tufts Univ., Medford, MA

Prepared for

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Nov 87

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This report summarizes the presentations and opinions of some of the nation's leading experts which were expressed at the conference. The agenda included the EPA perspective on household hazardous wastes; the history of household hazardouse waste; what are household hazardous wastes?; and the household products disposal council's view of what are household hazardous wastes.

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# SUMMARY OF THE SECOND NATIONAL
# CONFERENCE ON
# HOUSEHOLD HAZARDOUS WASTE
# MANAGEMENT

November 2-4, 1987

San Diego, California

Sponsored By:
U.S. Environmental Protection Agency

Conference Managed
by
Center for Environmental Management
Tufts University
and
American Public Works Association

Summary Prepared by:
The Center for Environmental Management
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## THE CENTER FOR ENVIRONMENTAL MANAGEMENT

The Tufts University Center for Environmental Management (CEM) was established in 1984 to develop an effective multidisciplinary approach to environmental problems through innovative health effects and technology research, policy analysis, education programs, and information transfer activities. CEM also acts as a neutral and independent forum center where citizens and representatives from government, academia, industry, and public interest/environmental groups can meet to discuss and resolve critical policy issues. The Center's activities are performed by a staff of scientists, engineers, policy analysts, and numerous faculty from the many schools and resource centers of Tufts University. The Center also sponsors research at other universities. Funding for the Center's projects is derived from state and federal grants, awards from foundations, and contributions from industry to the Center's Corporate Affiliates Program.

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The report is a compendium of presentations made at the second annual Household Hazardous Waste Management Conference. The summaries reflect the statements made by the speakers and they do not necessarily reflect the position of the Center for Environmental Management.

# TABLE OF CONTENTS

PAGE

OVERVIEW OF MAJOR NATIONAL AND INTERNATIONAL ISSUES

EPA Perspective on Household Hazardous Waste
Joseph Carra....................................1
Defining Household Hazardous Wastes
Allen Maples....................................6
Why Worry about Household Hazardous Wastes?
David Galvin....................................14
State Laws, Regulations, and Guidelines Regarding Household Hazardous Wastes
Dana Duxbury....................................20
Household Hazardous Waste Collection Program Liability
James Dougherty.................................25
Household Hazardous Waste - An International Perspective
Gerhard Vogel...................................28

OVERVIEW OF COLLECTION PROGRAMS

State Sponsored Programs
Felix Harvey....................................37
State Matching Grants
Leslie Lewis....................................41
Corporate Sponsorship
Ryan Delcambre..................................46
Regional Collection Programs
Emy Meiorin.....................................51
Paint Collections
Linda Pratt.....................................61
One Day, Multiple Site Collection Program
Richard Conlin..................................64
At A Landfill
William Merry...................................67
Permanent Site
Kate Gage.......................................73
Pilot/Permanent Site
Sandi Schafer...................................76

OVERVIEW OF OTHER MANAGEMENT OPTIONS

Introductory Remarks
Susan Ridgley...................................81
Reformulation
Robert Etter....................................83
Reuse and Recycling
Robert Ceru.....................................88
Paint Exchanges
Diane Christensen...............................91
Telephone Assistance Program
Ned Brooks......................................94
Concluding Remarks
Susan Ridgley...................................100

OVERVIEW OF SPECIAL WASTES
    Batteries
        Judy Orttung....................................101
    Waste Oil
        Donald Gilson...................................103
    Recycling Oil
        Douglas Kenyon..................................106
    Paint
        Robert Nelson...................................108
    Pesticides
        Janet Auerbach..................................112
        Johanne Gelinas.................................115

OVERVIEW OF PROBLEM WASTES
    Dioxins
        Allen Maples....................................118
        Liz McCormick...................................120
    Unknowns
        Bob Turkington..................................123
    Land Bans
        Allen Maples....................................124

OVERVIEW OF FUTURE FUNDING OPTIONS
    Introductory Remarks
        Gina Purin......................................126
    International Methods
        Gerhard Vogel...................................127
Excise Tax Opponent
        Donald Lofty....................................130
    Excise Tax Proponent
        Jolene Unsoeld..................................134

PANEL DISCUSSIONS
    EDUCATION
        Jack Lord, Moderator
        Panelists: Joanne Foster, David Harris,
            Leslie Lewis, Jack Lord.....................137
    LABELING
        Dana Duxbury, Moderator
        Panelists: Janet Auerbach, Lee Baxter
            Dana Duxbury, Jay Feldman, Donald Lofty.....143
    HOUSEHOLD HAZARDOUS WASTE CONSTITUENTS AND THEIR IMPACT
        David Galvin, Moderator
        Panelists: Tim Brown, K.C. Donnelly,
            William Franklin, Girish Nair...............145

HOW TO SET UP A HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM

Institutionalizing the Program
Lise Anderson....................................148
Sponsors/Co-sponsors
Leslie Lewis.....................................152
Site Selection
Darrell Cullen...................................157
Health and Safety
Larry Sweetser...................................160
Contractor Selection
LeeAnn Merashoff.................................165
Funding
Dana Duxbury.....................................168
Costs
Gina Purin.......................................171
Permanent Sites
Diane Christensen................................177
Education and Publicity
Joan Dotson......................................182
Management of Collected Wastes
Judy Orttung.....................................186

CLOSING REMARKS

Where Do We Go From Here?
David Conn.......................................188

CALIFORNIA LAWS AND POLICIES PERTAINING TO HOUSEHOLD HAZARDOUS WASTES

Introductory Remarks
Gina Purin.......................................192
Speakers: Alex Cunningham........................192
Sherman Roodzant.................................195
Harold Singer....................................198
Dorothy Rice.....................................201

## SPEAKERS

| NAME | TITLE OF SPEECH | PAGE |
|---|---|---|
| Anderson, Lise | Institutionalizing the Program | 148 |
| Auerbach, Janet | Labeling | 143 |
| | Pesticides | 112 |
| Baxter, Lee | Panelist: Labeling | 143 |
| Brooks, Ned | Telephone Assistance Program | 94 |
| Brown, Tim | Panelist: Household Hazardous Waste Constituents and Their Impact | 146 |
| Carra, Joseph | EPA Perspective on Household Hazardous Waste | 1 |
| Ceru, Robert | Reuse and Recycling | 88 |
| Christensen, Diane | Paint Exchanges | 91 |
| | Permanent Sites | 177 |
| Conlin, Richard | One Day, Multiple Site Collection Program | 64 |
| Conn, David | Where Do We Go From Here? | 188 |
| Cullen, Darrell | Site Selection | 157 |
| Cunningham, Alexander | CA Laws and Policies Pertaining to Household Hazardous Wastes | 192 |
| Delcambre, Ryan | Corporate Sponsorship | 46 |
| Donnelly, K.C. | Panelist: Household Hazardous Waste Constituents and Their Impact | 145 |
| Dotson, Joan | Education and Publicity | 182 |
| Dougherty, James | Household Hazardous Waste Collection Program Liability | 25 |

| NAME | TITLE OF SPEECH | PAGE |
|---|---|---|
| Duxbury, Dana | State Laws, Regulations, and Guidelines Regarding Household Hazardous Wastes | 20 |
| | Moderator - Labeling | 143 |
| | Funding Mechanisms | 168 |
| Etter, Robert | Reformulation | 83 |
| Feldman, Jay | Panelist: Labeling | 143 |
| Foster, Joanne | Panelist: Education | 139 |
| Franklin, William | Panelist: Household Hazardous Waste Constituents and Their Impact | 146 |
| Gage, Kathryn | Permanent Site | 73 |
| Galvin, David | Why Worry About Household Hazardous Wastes? | 14 |
| | Moderator - Household Hazardous Waste Constituents and Their Impact | 145 |
| Gelinas, Johanne | Pesticides | 115 |
| Gilson, Donald | Waste Oil | 103 |
| Harris, David | Panelist: Education | 141 |
| Harvey, Felix | State Sponsored Programs | 37 |
| Kenyon, Douglas | Recycling Oil | 106 |
| Lewis, Leslie | State Matching Grants | 41 |
| | Panelist: Education | 138 |
| | Sponsors/Co-sponsors | 152 |
| Lofty, Donald | Excise Tax Opponent | 130 |
| | Panelist: Labeling | 144 |
| Lord, Jack | Moderator - Education | 137 |
| Maples, Allen | Defining Household Hazardous Wastes | 6 |
| | Dioxins | 118 |
| | Land Bans | 124 |
| McCormick, Elizabeth | Dioxins | 120 |

| NAME | TITLE OF SPEECH | PAGE |
|---|---|---|
| Meiorin, Emy | Regional Collection Programs | 51 |
| Merashoff, LeeAnn | Contractor Selection | 165 |
| Merry, William | At a Landfill | 67 |
| Nair, Girish | Panelist: Household Hazardous Waste Constituents and Their Impact | 145 |
| Nelson, Robert | Paint | 108 |
| Orttung, Judy | Batteries<br>Management of Collected Wastes | 101<br>186 |
| Pratt, Linda | Paint Collection | 61 |
| Purin, Gina | Moderator - Overview of costs of Collection Programs<br>Introduction - Overview of Future Funding Options<br>Introduction: Calif. Laws and Policies Pertaining to Household Hazardous Wastes | 171<br>126<br>192 |
| Rice, Dorothy | Calif. Laws and Policies Pertaining to Household Hazardous Wastes | 201 |
| Ridgley, Susan | Introduction - Overview of other Management Options | 81 |
| Roodzant, Sherman | Calif. Laws and Policies Pertaining to HOusehold Hazardous Wastes | 195 |
| Schafer, Sandi | Pilot/Permanent Site | 76 |
| Singer, Harold | Calif. Laws and Policies Pertaining to Household Hazardous Wastes | 198 |
| Sweetser, Larry | Health and Safety | 160 |
| Turkington, Robert | Unknowns | 123 |
| Unsoeld, Rep. Jolene | Excise Tax Proponent | 134 |
| Vogel, Gerhard | Household Hazardous Waste- An International Perspective<br>International Methods | 28<br>127 |

## LIST OF EXHIBITS

Exhibit 1 - EPA's Approach to Defining HHW.......................7
Source: EPA Office of Solid Waste

Exhibit 1A - Composition of HHW: New Orleans, LA..................9
Source: noted on exhibit

Exhibit 1B - Composition of HHW: Marin Co., CA....................10
Source: noted on exhibit

Exhibit 2 - Waste Characteristics of Marin Households............16
Source: noted on exhibit

Exhibit 3 - Number of Collection Programs per Year...............21
Source: CEM

Exhibit 3A - 1981-1987 State Level HHW Laws and Regulations.......22
Source: CEM

Exhibit 4 - Tables of Recycling Rates for Zinc and Mercury.......30
Source: G. Vogel

Exhibit 4A - Strategies for the Elimination of Hazardous Substance from Household and Commercial Waste..................31
Source: G. Vogel

Exhibit 4B- Collection Results of Hazardous Waste Collection Systems.............................................34
Source: G. Vogel

Exhibit 5 - Comparison Data: Thousands of Pounds of Waste Collected...........................................49
Source: Delcambre Dow Chemical USA

Exhibit 5A - Comparison Data: Cost, $ Thousand...................50
Source: Delcambre, Dow Chemical USA

Exhibit 6 - Regional Hazardous Waste Collection Program..........52
Source: Association of Bay Area Governments, Oakland, CA

Exhibit 6A - HHW Collection Programs, San Francisco Bay Area 1983-1986............................................56
Source: Association of Bay Area Governments, Oakland, CA

Exhibit 6B - Alameda County Pilot Household Hazardous Waste Collection Program, Projected Waste Generation and Project costs, 1987................................58
Source: Association of Bay Area Covernments, Oakland, CA

Exhibit 7 - Non-chlorinated Solvents....................................96
Source: Minnesota Pollution Control Agency

exhibit 7A - Household Hazardous Waste....................................98
Source: Minnesota Pollution Control Agency

Exhibit 8 - The Cost of Different Collection Systems............128
Source: G. Vogel

Exhibit 9 - Contractor Comparison....................................173
Source: Golden Empire Health Planning Center,
Sacramento, Ca

Exhibit 9A - A Look at Pricing and Contractors...................174
Source: Golden Empire Health Planning Center,
Sacramento, CA

# LIST OF APPENDICES

Appendix I - Final Program

Appendix II - Speakers List

Appendix III - Clarification of Issues Pertaining to Household Hazardous Waste Collection Programs

Appendix IV - Household Hazardous Waste Collection Programs

Appendix V - Household Hazardous Waste Collection Program Report Form

Appendix VI - Bibliography on Household Hazardous Wastes

Appendix VII - Hazardous Household Substances List

# CONFERENCE ON HOUSEHOLD HAZARDOUS WASTE MANAGEMENT

The second National Conference on Household Hazardous Waste Management (HHWM) was convened on Monday afternoon, November 2, 1987 at the San Diego Marriott, San Diego, California, by Dana Duxbury, Senior Environmental Research Analyst at Tufts University's Center for Environmental Management.

## EPA PERSPECTIVE ON HOUSEHOLD HAZARDOUS WASTE

Joseph Carra, Director, Waste Management Division, Office of Solid Waste, U.S. EPA. The following is the text of Carra's speech:

I would like to welcome you to the second U.S. EPA Conference on Household Hazardous Waste Management. EPA is sponsoring this conference because it enthusiastically supports household hazardous waste (HHW) collection programs. EPA supports the work you are doing in towns and cities across the country as well as the purposes of the conference which are, as I see them, to provide communities with useful and practical information about HHW management programs--how to start them, how to make them better and also to explore issues of unique concern to HHW management problems.

We are excited about this conference because it brings together most of the key people in the HHW field who can share experiences and knowledge with us at EPA and with each other.

We are indeed fortunate to have a program consisting of speakers with a great deal of knowledge and experience in this important field. We have people from federal, state, and local governments, and from the private sector. We are pleased to have a distinguished speaker from abroad who will give us his perspective on activity in several foreign countries.

This conference comes at a time when there is a renewed, revitalized interest in the municipal solid waste stream at EPA, in the Congress, and at the grass roots level.

I would like to give you some perspective on municipal solid waste because the HHW program is a very important part of that overall perspective. In the last year, we have seen a barge filled with garbage wandering aimlessly around the ocean searching in vain for a home away from home. We have seen a major U.S. city encounter similar disposal problems with the ash residue from the combustion of its municipal solid waste. We have seen beaches on the East Coast closed because of apparent illegal disposal of municipal solid waste.

The chickens are coming home to roost. As America confronts over the next decades the consequences of being a throw-away society, as costs of disposal increase, and as more of these incidents occur, and I can assure you that they will, America will have to deal with this growing problem.

Over the next year the EPA over the next year will be submitting its reports to Congress on Subtitle D, a major portion of them deal with municipal solid waste landfills (MSWLF), finalizing new and stricter standards for MSWLF's, their design and operation. We are also working at the Office of Air and Radiation on new standards for municipal solid waste combustion developing specific standards for the safe disposal of the ash residues of municipal waste combusters.

We all know that Congress has been busy drafting various pieces of solid waste legislation. This month three separate solid waste hearings in Congress have been scheduled---just in the month of November alone. But all of these are end-of-pipeline fixes to our national problem. Certainly they are necessary, but they are not sufficient. We must revitalize EPA's involvement and leadership in the area of recycling, an area that got pushed to the wayside by the bulldozer of the Hazardous and Solid Waste Amendments (HSWA). We must look at the very beginning of the pipeline too. We must look to affecting source reduction through education and jawboning, as well as examining the possibility of using existing EPA authorities to effect labeling requirements or outright bans. The environmental and public health concern over the MSW stream is a result of two major sources, small quantity generator(SQG) wastes and household hazardous wastes (HHW). That is why this conference and the work that you are doing will, I believe, become increasingly visible and increasingly important.

## EPA'S PERSPECTIVE

I would like to take this opportunity to share with you EPA's perspective on HHW management programs and to address a couple of major issues that many communities have expressed concern about.

First, I want to reiterate the point that the Agency enthusiastically endorses these programs. We think the HHW collection programs are an excellent idea and we applaud effort and energy spent at the local and state level in organizing these programs. Although we cannot precisely define the contribution of HHW to environmental contamination, we know that HHW includes materials, such as solvents and pesticides, that have been shown to pose significant problems if not properly managed. Thus we should take every opportunity to carefully manage these wastes. Even a small fraction of hazardous materials in the 133 million tons of municipal solid waste generated annually is too significant an amount to be ignored.

An important benefit of these programs is public education. They increase the homeowners' awareness of the importance of carefully handling these household products from a safety point of view. The mindset of discarding materials in the trash (out of sight, out of mind) needs to be changed. We learn this mindset as children. The problem is that discarding these materials indiscriminately eventually comes back to haunt us. We need to educate people about this. Educational materials and public education, especially for school children, can go a long way to facilitate this change. These educational materials already exist. I would like to encourage the efforts made by various groups in assembling them. I believe the EPA can and should disseminate this information and encourage wider use of these materials. Public education about HHW also increases the homeowners' awareness of hazardous waste in general, i.e., hazardous waste generation and disposal problems are not unique to industry.

We recognize that there are some problems with collection programs. For example, costs are currently very high. We know that the experience in some programs has been that cost per ton drops as participation increases. Because of this it is important that we do all we can to get the participation rates up. In fact, this is already happening in some areas. I would urge you to share your knowledge of techniques used that have helped increase participation.

To be really successful these programs must be developed and initiated by State and local governments to fit the needs of the community. Each community must decide which type of program, if any, is best for its needs. EPA's role will continue to be that of providing technical assistance to state and local governments.

## TWO FEDERAL ACTS AND THE HWW ISSUE

### RCRA

First, I would like to emphasize that household wastes, including HHW, are exempt by definition from the RCRA hazardous waste regulations. The exemption applies even when HHWs are accumulated at a collection site. As a result, all of the Federal requirements for hazardous wastes, including the household waste manifest, legally do not apply to HHW. Therefore, there is no RCRA hazardous waste liability for sponsors of HHW collection programs. Please note that this is EPA's policy and that state policies may differ.

Even though EPA does not require that HHW be handled as a hazardous waste, we recommend that it be handled as such. If you have gone through the trouble and expense of collecting HHW, it should be treated or disposed of at a hazardous waste facility. In addition, we recommend that a manifest be used to track the wastes.

## CERCLA

With regard to CERCLA liability, a community would be potentially liable under CERCLA if a disposal site at which HHW was disposed became a Superfund site. Communities should recognize that this CERCLA liability applies whether the HHW is disposed of in a municipal waste landfill or in a hazardous waste landfill.

We realize that this liability is a major concern for many program sponsors. On a positive note, waste generated through a HHW collection program and taken to a Subtitle C landfill might be eligible for treatment as a *de minimis* quantity under the Superfund Amendment Reauthorization Act (SARA). Under this provision, final settlement could be expedited and potential future liability may be minimized. Clearly this is still a real problem.

## DIOXIN CONCERNS

Another major concern that has been expressed pertains to dioxins. I would like to clarify here today that EPA's hazardous waste rules on dioxin-containing wastes do not apply to any HHWs, including the various herbicides on the market. These rules only apply to the dioxin-containing wastes regulated under RCRA as specifically listed hazardous wastes, not any waste that contains dioxin. Because of the household exclusion discussed before, waste management contractors are legally permitted to take this waste, along with all other HHW collected, to a land disposal site, if that is the selected disposal/treatment option.

We have been trying to encourage waste management companies to accept dioxin-bearing HHW for treatment and disposal, because we believe that this is the solution to the problem. However, we are aware that few companies are currently willing to take this waste. We invite suggestions you may have in coming up with other ways to deal with this problem.

At last year's conference, we promised to issue a written policy statement addressing management of HHW, RCRA/CERCLA liability and dioxin concerns. Over the last year we have worked with Dana Duxbury at the Center for Environmental Management, and EPA's Office of General Counsel and Office of Enforcement Counsel. The policy is in final concurrence. We hope to issue it within a month. It will be sent to EPA regional offices, states, and waste management associations. (See Appendix III)

Despite the real obstacles let us look at how far you have come. The HHW collection programs began as a grassroots movement in 1981. An EPA publication reported that in 1986, 250 programs had been held. Interest and activities in HHW management have mushroomed. The latest figures show that since 1981, 849 programs have been held in 42 states. We hope that the number of programs and the participation rates of these programs continue to increase.

## CONCLUSION

On behalf of the EPA Office of Solid Waste I would like to thank the Center for Environmental Management of Tufts University and its Director, Tony Cortese, and always as a prime mover in this field, Dana Duxbury, for planning this conference, developing the agenda, and assuming the important responsibility for preparing a summary of the meeting.

I would also like to thank the Institute of Solid Waste of the American Public Works Association, specifically Bill Forester and Dan Hansen, for assisting Tufts in planning the meeting and for arranging for such a fine location. Enjoy San Diego!

## DEFINING HOUSEHOLD HAZARDOUS WASTES

Allen Maples, Environmental Scientist, Waste Management Division, Office of Solid Waste, U.S. EPA. Maples is the contact person at the US EPA on HHW issues.

Of the nearly 82 million households in the United States all produce at least some HHW. Each individual is calculated to generate one ton of waste per year, in the home, some part of which is hazardous. What is considered "hazardous" is variously defined, using different factors. Examples of definitions from the four major sources, EPA, the states, industry groups and public interest groups, were highlighted in Maples' presentation.

### EPA DEFINITION OF HOUSEHOLD HAZARDOUS WASTE (HHW)

The EPA approach to defining HHW is to combine the federal definition of hazardous waste with the definition of household waste. (EXHIBIT 1) Its definition of HHW is developed under RCRA, the federal law which regulates solid and hazardous waste management. The result, EPA feels, is a workable, generic definition of "household hazardous waste." More fully defined a household waste is, under the federal regulations, any solid waste that is discarded or generated from homes and similar dwellings. A household waste is considered hazardous if it is a listed hazardous waste, or it exhibits these hazardous characteristics:

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

This definition determines which of those household wastes would be regulated as hazardous waste if they were generated in larger quantities.

Under this definition the EPA has developed a list of broad categories of wastes that can be considered hazardous. While these types of products are those that are most often considered hazardous, exceptions do exist in each category.

### EPA'S LIST OF COMMON HAZARDOUS HOUSEHOLD PRODUCTS

- Household cleaners

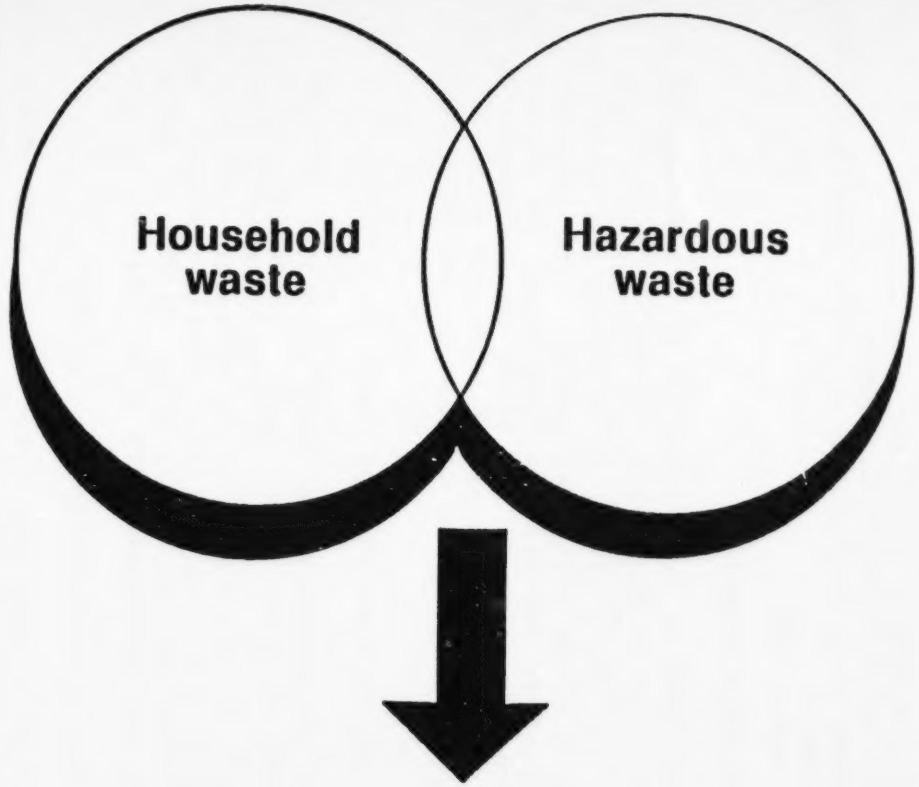
They commonly contain constituents such as sodium hydroxide, caustic soda, petroleum distillates, and isopropanol.

- Automotive products

They usually contain a variety of organic solvents, petroleum distillates that are usually highly ignitable and sometimes emit toxic fumes.

Exhibit 1

# EPA's Approach to Defining HHW



Household waste

Hazardous waste

Household Hazardous Waste

Source: Allen Maples, Office of Solid Waste, U.S. EPA

- Home maintenance and improvement products

Organic solvents are also common to this category. This category contains such products as paint thinners, strippers and removers, and adhesives.

- Lawn and garden products

This category covers products such as herbicides, fungicides, and insecticides.

- Miscellaneous, examples of which are:

  Photo processing chemicals
  Batteries and electronic items
  Personal care products (e.g., nail polish and polish remover)
  Pool chemicals

## STUDY OF HHW COMPOSITION

In April, 1987 an EPA-funded study was published entitled "Characterization of Household Hazardous Waste from Marin County, California and New Orleans, Louisiana." The report was prepared by the EPA's Office of Research and Development in Las Vegas and by Florida State University. The data was collected and synthesized by the Garbage Project at the University of Arizona. The objective of the study was to determine the amount and characteristics of HHW that are entering landfills. (EXHIBITS 1-A, 1-B show the components and percentages of waste.)

## STATE AND LOCAL DEFINITIONS OF HHW

A number of organizations have attempted to define HHW by listing items considered hazardous. These efforts are most commonly done at the local level when community groups and organizations decide they want to organize a collection program. These lists vary widely. Usually major categories are assembled and often they are similar to EPA or state definitions, but sometimes they do differ.

### Washington State's Definition of HHW

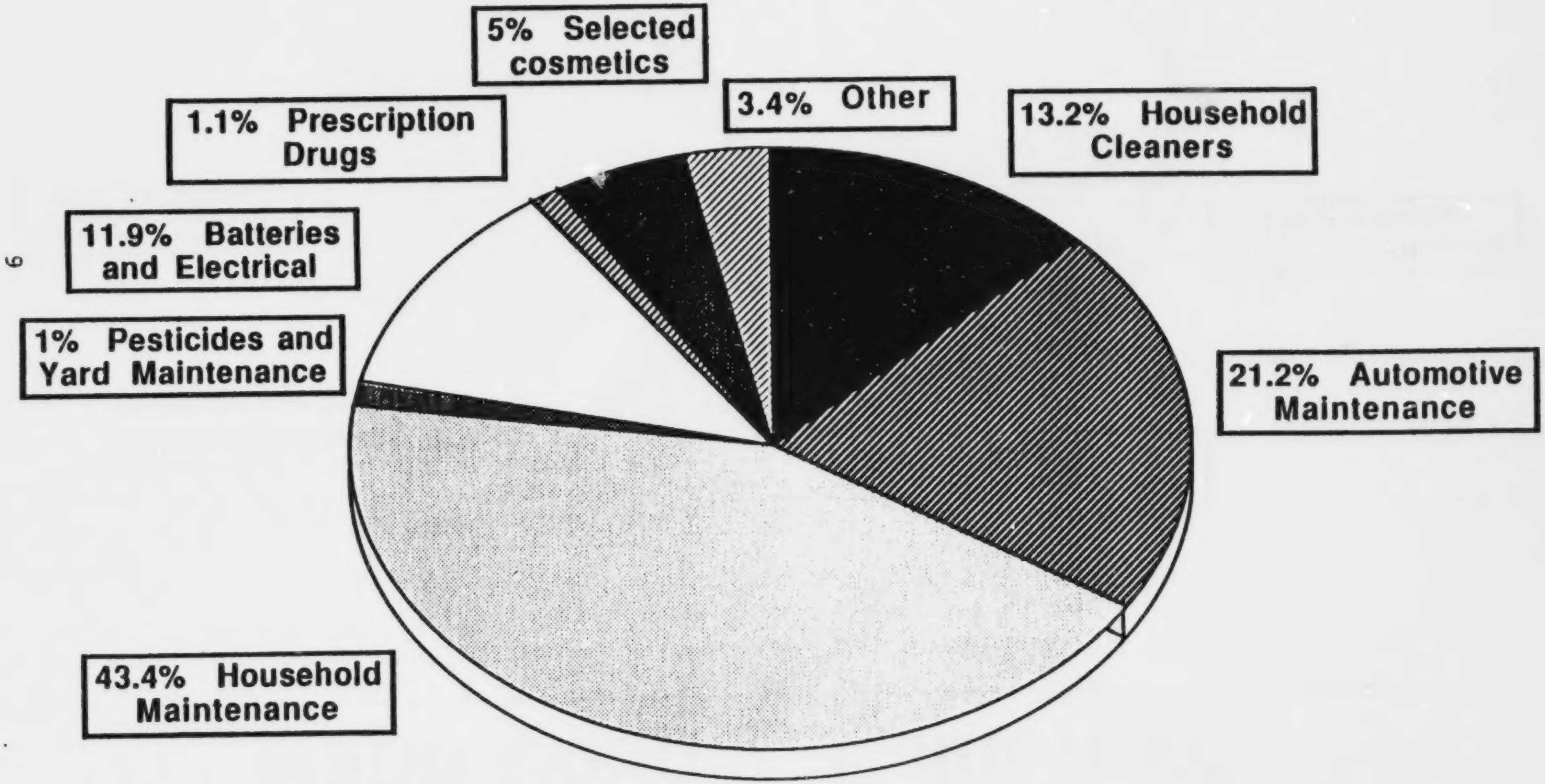
In Washington they make reference to their state criteria for dangerous waste in defining household hazardous substances.

The definition reads: "Household hazardous substance means any liquid, solid, contained gas or sludge, including any material, substance or product, commodity or waste, used or generated in the household, regardless of quantity, that exhibits any of the characteristics or criteria of "dangerous waste" as set forth in Chapter 173-303 of the Annotated Code. Such substances become moderate risk waste when discarded."

The Washington State HHW statute requires that local hazardous waste planning guidelines be set up. These guidelines

Exhibit 1A

# Composition of HHW: New Orleans, LA*

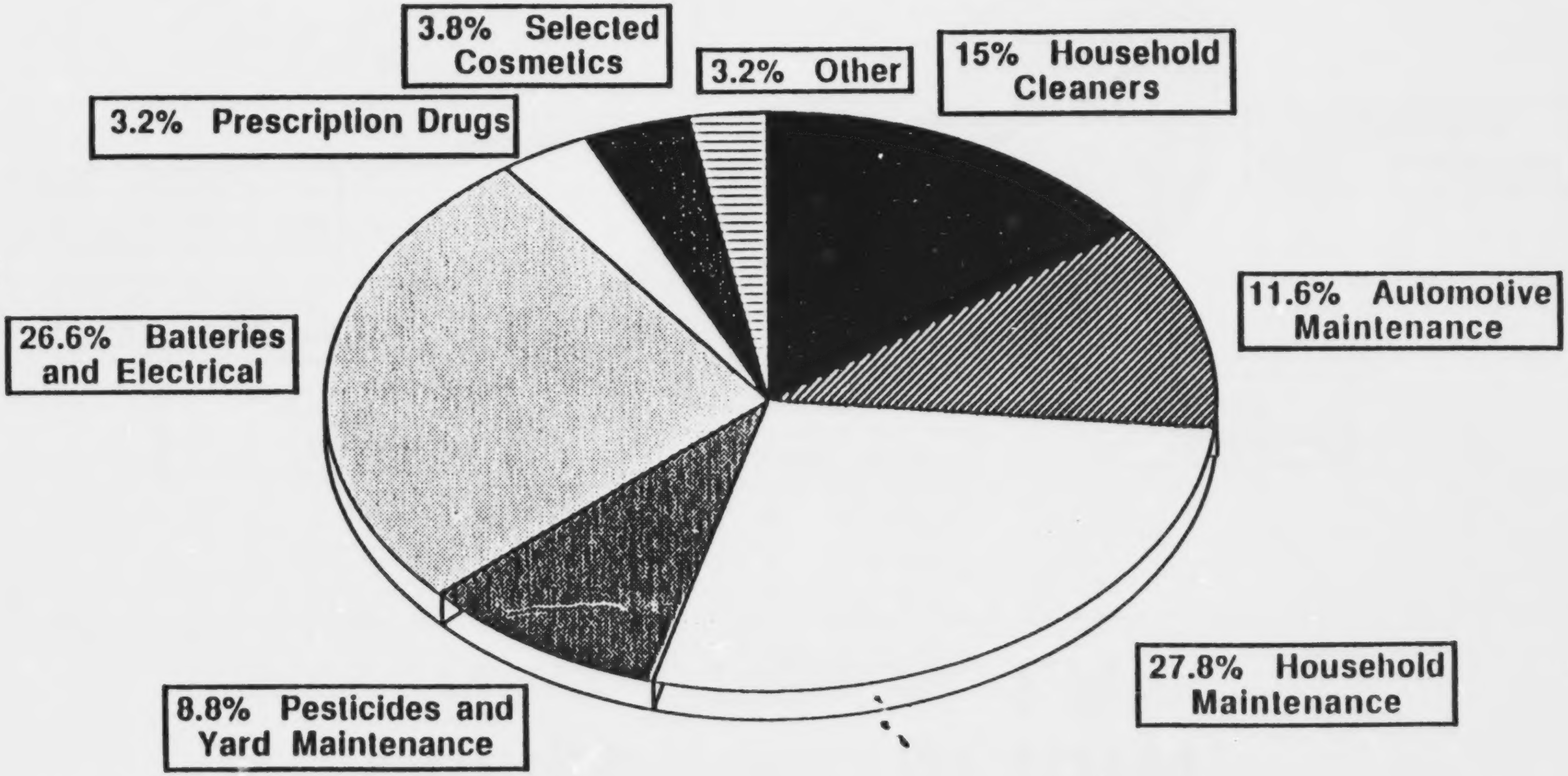


All percents are by total weight

* Source: Characterization of Household Waste from New Orleans, LA, April 1987

Exhibit 1B

# Composition of HHW: Marin County, California*



All percents are by total weight

* Source: Characterization of Household Waste from Marin County, CA, April 1987

in draft form have been issued by the state's Department of Ecology. Those guidelines suggest that local planning efforts use chemical ingredients of individual products as a basis for discriminating between hazardous and non-hazardous products. A list is also provided with common household hazardous substances with the common constituents contained in those products. The state has come up with six broad categories:

Paint products
Cleaning agents
Pesticides
Auto, boat, and equipment maintenance products
Hobby and recreation materials
Miscellaneous

### Iowa's Definition of HHW

The Iowa definition reads: "Household hazardous material means any product used for residential purposes and designated by rule of the Department of Natural Resources and may include hazardous substances, as defined, and hazardous waste, as defined, and shall include but is not limited to: motor oil, motor oil filters, gasoline and diesel additives, degreasers, waxes, polishes, solvents, paints, with the exception of latex based lacquers, thinners, caustic household cleaners, spot or stain removers with petroleum base or petroleum-based fertilizers.

A unique aspect of the Iowa definition is the list of substances which are excluded. These products are:

Laundry detergents or soaps
Dishwashing compounds
Chlorine bleach
Personal care products and soaps
Cosmetics
Medications

### California: Status of State Definition of HHW

In California, in 1986, a law was passed directing the state to develop a definition of HHW. The California Waste Management Board and the Advisory Commission on Household Hazardous Waste are in the process of developing this definition.

## INDUSTRY'S PERSPECTIVE

The Chemical Specialties Manufacturers Association (CSMA) has a position on HHW and maintains that certain household materials should be segregated from the general waste stream. CSMA believes that these materials are easily distinguishable from normal household consumer products.

These materials include:

- Certain pesticides that have been scientifically determined to persist in the environment, such as DDT.
- Extremely toxic materials that pose a human health hazard, such as arsenic or strychnine.
- Used motor oil and gasoline which can be recycled and refined.
- Ammunition and explosives.
- Unidentified materials of a suspicious nature.

CSMA's Definition of HHW

"A discarded material, product or mixture that reaches groundwater from solid waste landfills or improper disposal, or reaches surface water from disposal in sewer systems or septic systems, IN SUFFICIENT QUANTITIES to create, by itself or in conjunction with other materials, a verifiable level of toxicity that could affect human health or the environment."

The National Paint and Coatings Association (NPCA), in an April 1987 HHW policy statement, generally supported the federal definition of HHW as put forth by the EPA.

The following points were made by NPCA in its policy statement:

- Only small quantities of hazardous waste are disposed of in municipal landfills.
- Most products are hazardous only in large bulk quantities.
- The small amount of hazardous material is absorbed by solid waste.
- More scientific evidence is needed.

NPCA addressed the issue from the perspective that there is insufficient scientific evidence to conclude that the disposal of household chemical products, including paints, in municipal landfills, creates an adverse impact on the environment. NPCA believes that the extent of environmental and health hazards posed by the disposal of household chemical products and their waste streams in municipal landfills is not fully determined.

## PUBLIC INTEREST GROUPS

The National Audubon Society's (NAS) perspective on HHW was cited as a specific example.

NAS's position is that a product should be considered to be hazardous if it exhibits any characteristics which are:

- Toxic
- Reactive
- Ignitable
- Corrosive
- Infectious
- Radioactive

NAS has developed a generic list, as have many other groups, which includes:

- Pesticides, herbicides
- Paint products and preservatives
- Cleaners
- Automotive wastes or products

## CONCLUSION

Organizations concerned with managing HHW have adopted various approaches in defining which discarded materials are a threat to human health and the environment.

EPA believes that most household products are safe if used properly and safely stored. The agency believes that research should focus on the fate and effects of these products when disposed.

# WHY WORRY ABOUT HOUSEHOLD HAZARDOUS WASTES?

David Galvin, Water Quality Planner, Seattle Metro, Seattle, WA.

Galvin began his remarks by noting that consumer products contain many of the same chemicals that have caused industrial problems and that they can cause immediate problems to users if not handled carefully. It would be logical to assume, therefore, that if they are hazardous when on the shelf or in use, they might also be hazardous if thrown away. His talk then was broken down into the various waste streams and the documented or potential problems that can occur from HHW.

## MUNICIPAL SOLID WASTE

Solid waste is defined as any waste that is not disposed of down the sewer. 133 million tons of municipal solid waste (MSW) are produced in the United States per year (1984 figure). This works out to two to five pounds per person per day. For residential collections it works out to a little over two pounds per person per day. Some characteristics of MSW are that it is mostly (over 60 percent) paper and other organic materials, 10 percent is metals, 10 percent glass, 7 percent plastics. The total water composition is about 2 percent.

## HOW MUCH OF MSW IS HAZARDOUS AND HOW MUCH OF IT COMES FROM HOUSEHOLDS?

I. One of the first attempts to quantitatively assess HHW's contribution was a study done in Los Angeles which concluded that household wastes contribute .00147 percent (15 parts per million) to the hazardous waste in the MSW stream. People are now shying away from that study because it did not systematically look at HHW, but rather was focused on larger, commercial-sized containers.

II. A study was done in 1985 for the Puget Sound Council of Governments by Cal Recovery Systems, Inc. The area of the study was Seattle/King County, with a population of 1.3 million. The study found that 11,000 tons per year of hazardous waste (about 1 percent of MSW) were reaching the Seattle area landfill in the MSW stream. The contribution of households was significant: about half of the 1 percent was HHW by weight, coming from a combination of residential pick-up and self-haul to the transfer stations. By contrast, there were about 30,000 tons of RCRA-regulated wastes generated in the same area. Of these regulated wastes, only a quarter, roughly 7,500 tons, were disposed of off-site. In other words, the amount that is thrown away unregulated (HHW plus SQGs) is comparable to that which is thrown away regulated, at least in the Seattle/King County area.

III. The Stanford Research Institute is now doing a study for the California Waste Management Board. It is attempting to estimate the concentration of HHW constituents in MSW by extrapolating from generic recipes by product class -- an interesting approach. Interim reports have a calculation of about 3500ppm HHW constituents in MSW, or 0.35 percent.

IV. The University of Arizona's Garbage Project has recently completed EPA-funded studies in Marin County, California, and New Orleans, Louisiana wherein residential pick-up loads were sampled for HHW. They found 0.35-0.40 percent of MSW (at curbside pick-up) was hazardous. While the rate of total HHW discard and general composition were found to be similar in both study areas, differences occurred by sociodemographic structure, as shown in Exhibit 2. The conclusion of the University of Arizona's report was that "there are significant amounts of hazardous waste in household garbage and even the most conservative estimates of the amount discarded for a community are substantial."

All of these studies are finding HHW in MSW at around 1/2 of 1 percent by weight. The significance of such figures is open to much debate, but hazardous wastes do exist in the MSW stream and any of them are coming from HHW, not SQGs.

## WHAT PROBLEMS MIGHT HHW CAUSE IN MUNICIPAL SOLID WASTE?

### Sanitation Workers' Injuries

In the state of California, in 1982, 3 percent of all refuse collection workers were injured due to contact with household hazardous waste mixed in with trash or garbage. A new City of Los Angeles study for the period 1980-85 shows:

36 injuries due to identified chemical burns
29 injuries from inhaled chemicals
93 injuries from contact with unidentified chemicals

Since 1985 a change of equipment has reduced the number of injuries. There has been no national attempt to consolidate information on injuries to sanitation workers, but most public works departments will acknowledge incidents.

### Equipment Damage

MSW compactor trucks have been damaged in incidents all over the United States due to fires and explosions. There are accidents wherever shredders are used, such as in Duluth, Minnesota; Columbus, Ohio or Albany, New York, to name but a few notorious incidents. A recent book on resource recovery concluded, "Almost every shredding operation in the country has experienced some degree of explosion problems."[1]

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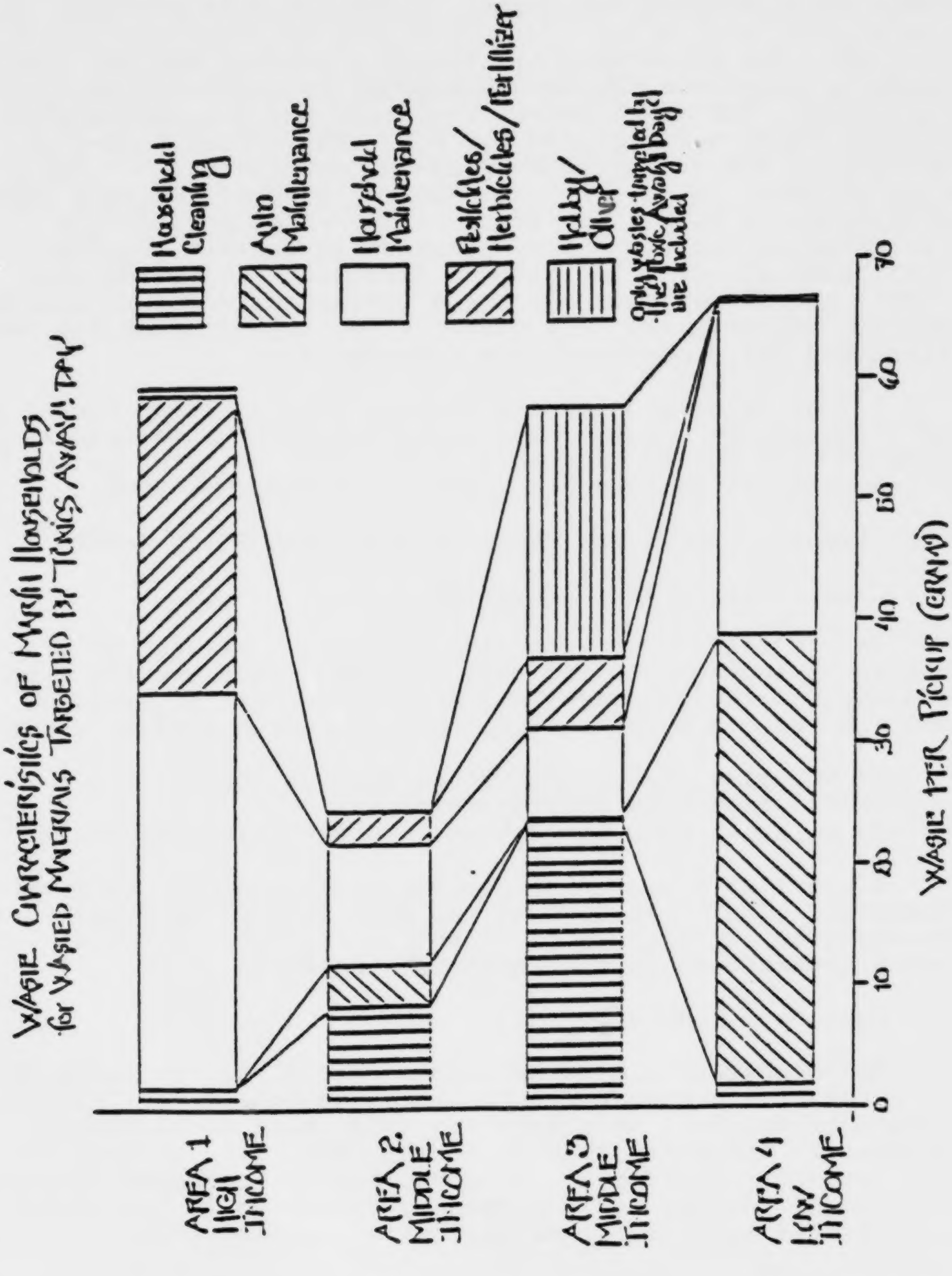
[1] Popp., P.O. and R.E. Melberth (1985) Decision - Making in Local Government: The Resource Recovery Alternative Lancaster: Technomic.

Exhibit 2



[From: Rathje et al. 1987. A Characterization of Hazardous Household Wastes in Marin County, California. Oakland: Association of Bay Area Governments.]

### Municipal Landfill Leachate

In the United States, 95 percent of all MSW is landfilled. EPA's 1986 Subtitle D report concluded that less than 1/2 of municipal landfills have runon/runoff controls, only 1/4 have groundwater monitoring systems, only 15 percent have liners, only 5 percent have leachate collection systems, and only 40 percent employ any waste restrictions. No surprise then that 20 percent of all National Priority List (Superfund) sites are old municipal landfills.

Although municipal landfills may have things going into them from sources other than households, the leachate coming out has chemicals that are in household products as well as chemicals that are in commercial products that might come from SQGs. There is a lot of debate about the significance of the leachate studies that have been done, but there are some interesting ones that seem to show that even very rural municipal landfills, ones that have had no type of industrial source, have organic chemicals coming out in the leachate. At one of Seattle Metro's municipal sewage treatment plants, leachate taken from a collection system at the large municipal landfill for Seattle/King County is found to be loaded with a number of organic chemicals -- many of the phthalates, phenol, methylene chloride, trichlorethylene, ethylbenzene, toluene -- all of which are found in consumer products.

Air emissions from landfills are another problem. These emissions include vinyl chloride, a known carcinogen, among a suite of hazardous chemicals detected. Studies in California are showing vinyl chloride levels coming out of the landfills that violate state standards in nearby residential areas, not just in the landfill itself. The vinyl chloride is being produced by bacteria working on trichloroethylene (TCE) and other chlorinated, 2-carbon organic solvents in the landfill, not primarily from plastics.

In concluding his discussion of the landfill question Galvin quoted a New York official, "The bottom line is that toxic and hazardous organic contaminants...are ubiquitous in municipal waste leachate. This appears to be true regardless of whether hazardous waste is known to have been co-disposed or whether it's all residential waste or not. The likely source of these contaminants would appear to be the hazardous chemicals normally found in...household products."[2]

### Incineration and Resource Recovery

About 5 percent of MSW in the United States is currently burned. Projections expect this to increase to 20 percent by early in the next century. There are controversies over production of dioxins and benzofurans coming out of these facilities. Quoting from "Decision-making in Local

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[2] D.J. Wotterding, Associate Engineering Geologist, New York State Department of Environmental Conservation in a letter to Girish Nair, Tufts University, Center for Environmental Management, August 27, 1987

Governments: The Resource Recovery Alternative," Galvin said "Sludge residues, fly ash [and] grate ash from combustion processes...contain concentrated levels of heavy metals and complex organics that require special landfill procedures." The EPA is involved currently in a debate on whether this is in fact a hazardous waste or not.

Referring to a visit made a year ago to Kommunekemi in Denmark Galvin reported on the practices at this national center for handling hazardous wastes from both household, small commercial, and industrial sources. At Kommunekemi they go through every single drum of HHW that comes into the facility to pull out certain constituents, including batteries, pharmaceuticals, and other things that contain mercury, for example. They do not want any of these things to go through even their hazardous waste incinerator.

- Municipal wastewater

All HHW does not go into the solid waste stream. As an expert in sewage treatment and water quality Galvin noted that a lot of HHW goes down the drain. Municipal domestic sewage is 99.9 percent water. Therefore, any constituents (not just hazardous) are a very small percentage, by weight, yet sewage is not considered squeaky clean. Domestic plumbing equipment was not meant to handle hazardous constituents.

- Septic tanks

Septic tanks, in particular, are a real problem because they are not designed to handle hazardous waste or any hazardous chemicals. One third of all United States housing units use septic tank/drainfield systems and one-quarter of all new homes being constructed in the United States use them. The four counties with the highest density of septic tanks, possibly over 100,000 per county, are Dade County, Florida, Los Angeles County, California and two counties (Nassau and Suffolk) on Long Island, New York. The predominance of septic systems is in the Northeast. Many things go through the drainfield in a septic system and come right out the bottom. Organic cleaners, solvents, paint thinners and the like do not bind to soil particles. They go right through one of these systems and adjacent soils into the groundwater. More and more documentation is showing problems in the ground, in areas which either receive direct septic tank leaching or receive the leaching from septage lagoons where the pumpings from septic tanks are left to drain dry.

Municipal Sewerage Systems

The wastewater stream in a municipal treatment system is not just domestic organic waste. A Seattle area study of the sources of hazardous chemicals to the municipal sewage treatment plant showed that for a number of contaminants the non-industrial sources were much higher percentage contributors than any of the industries, most of which were under pre-treatment permits. A secondary sewage treatment process is quite effective at removing a lot of the organic solvents and other volatile organics from the wastewater. The reason, however, is that the secondary process just aerates the wastewater which shoots these volatile organic compounds up into the air where they become someone else's problem.

Other Direct Avenues:

o Storm drains

Galvin said that he has regular experience with the effects of gasoline dumped down storm drains. In Seattle there have been explosions in the streets because of it. Waste oil and antifreeze are also commonly put down storm drains, as in some cases are pesticides. The waste oil has caused bird kills. The pesticides have caused fish kills in Seattle's urban streams. There is usually no treatment of contaminated storm drains. The runoff goes directly into the nearest body of water.

o Direct dumping

Direct dumping on the ground is another source of damage to groundwater. Direct dumping was cited as a major source of aquifer problems in Dade County, Florida, and this recognition helped initiate Florida's HHW Amnesty Days program.

o Storage

Many household hazardous materials are saved and not thrown away until someone dies or moves. Storage is a management option for many people. Every collection program has its horror stories of old or exotic things turned in. At the least, collection programs should sweep out those old, banned or cancelled products that are even more hazardous than today's products, in order to prevent them from getting into the waste streams.

## SUMMARY

HHW is a solid waste issue, and it is also a wastewater treatment issue, a direct dumping into the environment issue, and a storage, safety, and poisoning issue. As Galvin put it, "We need to find a better way to manage household hazardous waste, so that the salmon continue to come back to my hometown without being poisoned in the waters in the Seattle area, and so that all of your allegorical salmon -- and that can include all of us in terms of human health as well -- can likewise enjoy a healthy environment."

# HOUSEHOLD HAZARDOUS WASTE: STATE LAWS REGULATIONS AND GUIDELINES REGARDING HOUSEHOLD HAZARDOUS WASTES

Dana Duxbury, Senior Environmental Research Analyst, Center for Environmental Management, Tufts University, Medford, MA.

The Center for Environmental Management has prepared a data base which includes each of the 849 programs that have been held in 42 different states since HHW collection programs began in this country in 1981. (See Appendix IV) Since neither the EPA, the states or any other entity in the country require reporting of collection programs Duxbury made a request for additional or amended information on the data gathered. In addition she mentioned the report form which the Center asks collection program sponsors to complete. (See Appendix V) These forms provide a more detailed picture of all aspects of collection events.

Most of the programs listed in the CEM data base were held on a single day and collected the range of HHW. However, there were others established to collect special wastes, such as oil, pesticides, paints. Increasingly permanent programs have been established. The Center regards a program which is open at least one day a week throughout the year as a permanent collection program. When multiple sites in a community are open on a single day it is listed in the data base as a single program. If however there are multiple collection sites on multiple days each day is counted as a single program.

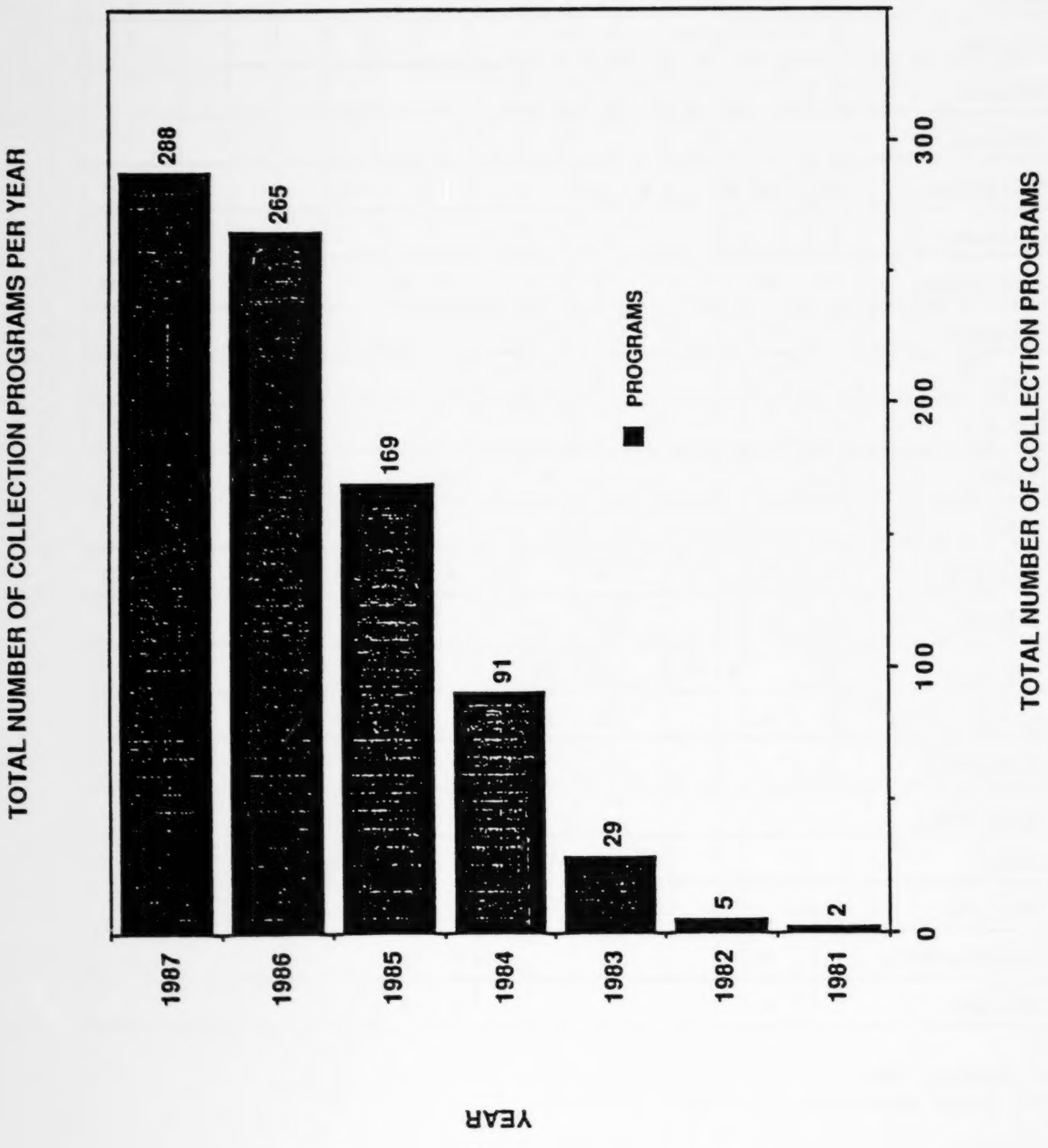
The data base also tracks the number of participants, amount of waste collected and the cost of the program. There is no standard system for measuring the specific amounts of waste collected or the exact cost. Some measure amounts by number of 55-gallon drums, some of which are lab-packed, some bulked, others use gallons or pounds of waste collected. For costs, some figures include all costs, direct and indirect, others are for waste contractor fees only. Anyone requiring a more detailed analysis of a specific program should contact the program sponsor.

Exhibit 3 is a chart showing the number of programs per year and the annual growth in programs.

Many states have developed a series of laws, rules, regulations for guidelines, studies and funding mechanisms. (Exhibit 3A) This document listed the variety of activities that the states are engaged in, whether its a law, a study, guidelines, a labeling provision, education program, pilot clean-up project, state matching grants, etc.

Some of the laws are comprehensive. Others may only establish a state program. Guidelines or regulations govern how a local sponsor administers a program and, in some cases, require that the state review a plan before the collection program is held. State matching grants have been a successful way of encouraging more collection days. States continue to play an active role in this issue in many parts of the country.

Exhibit 3



TOTAL NUMBER OF COLLECTION PROGRAMS PER YEAR

Source: Center for Environmental Management, Tufts University

## 1981 - 1987
## STATE LEVEL HOUSEHOLD HAZARDOUS WASTE LAWS AND REGULATIONS

| | Law | Study | Regulation/and or Guidelines | Define HHW | HHW Products Labelling | Reduction of Liability | State Education Programs | State Run Clean-up Programs | Pilot Clean-up Programs | State Legislative Appropriation | State Matching Grants | Use of State Superfund $ | State Solid Waste Superfund $ | EPA Clean-up Grant $ | Retail Sales Permit Fee | Advisory Com. Report | Evaluation Report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Alaska | | | | | | | | ● | | ● | | | | | | | |
| 2. Alabama | | | | | | | | | | | | | | | | | |
| 3. Arizona | | | | | | | | | | | | | | | | | |
| 4. Arkansas | | | | | | | | | | | | | | | | | |
| 5. California | ● | | ● | ● | | ● | ● | | | | | ● | | | | ● | |
| 6. Colorado | | | | | | | | | | | | | | ● | | | |
| 7. Connecticut | ● | | ● | | | | ● | | | ● | ● | | | | | | ● |
| 8. Delaware | | | | | | | | | | | | | | | | | |
| 9. Florida | ● | | | | | | ● | ● | | ● | | | | | | | |
| 10. Georgia | | | | | | | | | | | | | | | | | |
| 11. Hawaii | | | | | | | | ● | | ● | | | | | | | |
| 12. Idaho | | | | | | | | | | | | | | | | | |
| 13. Illinois | ● | | ● | | | | ● | | | ● | ● | | | | | | ● |
| 14. Indiana | | | | | | | | | | | | | | | | | |
| 15. Iowa | ● | | | ● | ● | | ● | ● | ● | | | | | | | | |
| 16. Kansas | ● | | ● | | | | ● | ● | ● | | | ● | | | | | |
| 17. Kentucky | | | | | | | | | | | | | | | | | |
| 18. Louisiana | | | | | | | | | | | | | | | | | |
| 19. Maine | | | | | | | | | | | | | | | | | |
| 20. Maryland | | ● | | | | | | | | | | | | | | | |
| 21. Massachusetts | | | ● | | | | | | | ● | ● | | | | | | |
| 22. Michigan | | | ● | | | | | | | ● | ● | | | | | | |

DATE: October, 1987
SOURCE: Tufts University, CEM, (617) 381-3486

Exhibit 3A

1981 - 1987

## STATE LEVEL HOUSEHOLD HAZARDOUS WASTE LAWS AND REGULATIONS

| | Law | Study | Regulation/and or Guidelines | Define HHW | HHW Products Labelling | Reduction of Liability | State Education Programs | State Run Clean-up Programs | Pilot Clean-up Programs | State Legislative Appropriation | State Matching Grants | Use of State Superfund $ | State Solid Waste Superfund $ | EPA Clean-up Grant $ | Retail Sales Permit Fee | Advisory Com. Report | Evaluation Report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minnesota | ● | | ● | | | | ● | ● | ● | ● | | | | | | | ● |
| Mississippi | | | | | | | | | | | | | | | | | |
| Missouri | ● | ● | | | | | | | | ● | | | | | | | |
| Montana | | | | | | | | | | | | | | | | | |
| Nebraska | | | | | | | | | | | | | | | | | |
| Nevada | | | | | | | | | | | | | | | | | |
| New Hampshire | | | ● | | | | | | | | ● | ● | | | | | |
| New Jersey | | ● | | | | | | | | | | | | ● | | | |
| New Mexico | | | | | | | | | | | | | | | | | |
| 2. New York | | ● | | | | | | | | ● | ● | | | | | | |
| North Carolina | | ● | | | | | | | | | | | | | | | |
| North Dakota | | | | | | | | | | | | | | | | | |
| Ohio | | | | | | | | | | | | | | | | | |
| Oklahoma | | | | | | | | | | | | | | | | | |
| 7. Oregon | ● | | ● | | | | | | | | | | | | | | |
| Pennsylvania | | | | | | | | | | | ● | | | | | | |
| Rhode Island | | | | | | | | ● | | ● | | | | | | | |
| South Carolina | | | | | | | | | | | | | | | | | |
| South Dakota | | | | | | | | | | | | | | | | | |
| 2. Tennessee | | | | | | | | | | | | | | | | | |
| Texas | ● | | ● | | | ● | | | | | | | | | | | |
| 4. Utah | | | | | | | | | | | | | | | | | |

DATE: October, 1987
OURCE: Tufts University, CEM, (617) 381-3486

Exhibit 3A cont'd

1981 - 1987

## STATE LEVEL HOUSEHOLD HAZARDOUS WASTE LAWS AND REGULATIONS

| | Law | Study | Regulation/and or Guidelines | Define HHW | HHW Products Labelling | Reduction of Liability | State Education Programs | State Run Clean-up Programs | Pilot Clean-up Programs | State Legislative Appropriation | State Matching Grants | Use of State Superfund $ | State Solid Waste Superfund $ | EPA Clean-up Grant $ | Retail Sales Permit Fee | Advisory Com. Report | Evaluation Report |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45. Vermont | | | ● | | | | | | | ● | | | | | | | |
| 46. Virginia | | ● | | | | | | | | | | | | | | | |
| 47. Washington | ● | ● | ● | ● | | | ● | | | | | | | | | | ● |
| 48. West Virginia | | | | | | | | | | | | | | | | | |
| 49. Wisconsin | | | ● | | | | ● | | | ● | ● | | | ● | | | |
| 50. Wyoming | | | | | | | | | | | | | | | | | |

DATE: October, 1987
SOURCE: Tufts University, CEM, (617) 381-3486

Exhibit 3A cont'd

# HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM LIABILITY

James Dougherty, Section Chief, Office of Enforcement and Compliance Monitoring, U.S. EPA.

Mr. Dougherty began by limiting the scope of his speech to liability issues under RCRA and CERCLA. He pointed out that under state laws there could be other forms of liability (such as accidents on site).

## RCRA

Most lay people think of RCRA as the hazardous waste management statute. In fact, the scope of RCRA extends to solid waste management of all kinds. In the definition section, section 1004, solid waste is defined quite expansively. Basically, everything which is thrown away is subject to RCRA.

Is HHW a hazardous waste under Subtitle C of RCRA?

Looking at the statute the answer is yes, because this is obviously solid waste and by definition is hazardous. Legislative history indicates that Congress did not want EPA to treat HHW as a Subtitle C waste.

Taking the Congressional cue, EPA issued a regulation at the advent of their RCRA program. 40 CFR Section 261.4 paragraph b sub-paragraph 1 states that the term "hazardous waste" shall not be construed to include HHW. HHW is a solid waste, but is not a hazardous waste, and, for that reason, is exempt from Subtitle C. This EPA regulation has many implications. From a legal standpoint it is not necessary to get a permit to store HHW.

## CERCLA

Dougherty reported that under CERCLA there is both good news and bad news.

The bad news. CERCLA has been described , particularly by corporate officers and corporate lawyers, as the most aggressive, harsh, unconstitutional, unfair environmental statute, indeed statute in general, ever enacted by Congress. When it comes to the substantive issues it is hard not to agree with them.

Section 107 provides that if EPA has to go in and clean up a site (a Superfund site) they can recover their costs from absolutely everyone associated with transporting hazardous substances to the site.

The second bit of bad news and another way in which the statute is extremely aggressive is that it imposes "joint and several liability". "Joint and several" means that if there are a lot of defendants in a case they will be expected to share the cost of the clean-up. If, however, only one responsible party can be found that party will be expected to pay the entire bill.

The third way in which CERCLA is tough is that once the EPA has resolved its liability with a responsible party, either through getting a court judgement or from a settlement agreement, they have the statutory right, which they exercise, to go back to that party, whether it is after five years or 50, if they find the original remedy was not effective. The party is still liable. EPA has releases in all of their settlement agreements, but there are "re-openers" included in them which state that if more waste is found or if EPA has to go back to the site for any reason the parties are still liable. Fortunately, the real world scenarios are not nearly so pessimistic.

## COLLECTION PROGRAM LIABILITY

There are two ways in which collection program sponsors can be liable. The first is liability for a transportation accident. The potential liability is pretty manageable. A spill would be of containerized waste. It would not result in soil contamination, ground water impairment, or the sort of thing that runs up costs at clean-up sites. EPA would go after the transporters, as well as the sponsors. DOT (Department of Transportation) regulations require that companies transporting these materials have very large amounts of insurance.

The greater cause for concern is if HHW is taken to a RCRA hazardous waste management facility and there is a problem at the site. EPA would have to spend money to deal with the problem and the sponsor would be liable. That is very unlikely however. First, this assumes that EPA's required environmental controls have failed. Secondly, if this were the case, EPA would go after the owners and operators of the facility. These are generally Fortune 500 companies which have the money to pay for these clean-ups and have a legal obligation to do so by their permits and by statute. There is a very active RCRA enforcement program that is directed just at owners and operators. EPA requires them to provide financial assurances to cover these problems. They are also required by EPA to obtain insurance to cover sudden and accidental releases.

Dougherty set forth the worst possible case. There has been a serious release. The owners/operators cannot be made to pay. He noted that to date EPA has never been in a situation where they have had to go beyond the owners/operators. If EPA determined that the environmental risk at this site needed to be addressed under Superfund and placed on the National Priorities List, they would conduct what is called a PRP (potentially responsible party) search. There would be a search to identify any party which sent or transported waste to the site or who owned the site. In one case, EPA has 4,500 PRPs. It would not be unusual to have 75, or 200, or 800. Through RCRA's regulations and documentation requirements EPA would be able to find out who sent waste to a facility.

Under joint and several liability, where there are a lot of parties, they join and pay together. Typically, the responsible parties in the case will organize themselves and come up with an allocation, sometimes referred to as an "nbar (nonbinding preliminary allocation of responsibility)." It is a list of all the parties that sent waste the site and their respective proportions.

At a big site, a Subtitle C facility, EPA might first start to go after a chemical company which sent 10 percent of the waste to the site (that's probably on the high side) and the percentages go down from there. At the bottom end, which is where sponsors of collection programs would be, the percentages are down in the range of .001, .01 percent , a small fraction of 1 percent. $10 million is a large sum of money, however 1/100 of 1 percent is only $1,000. This, for the collection program sponsor, is liability that would be incurred only after EPA has failed in their RCRA enforcement efforts, a site has been converted to a Superfund Site, and a CERCLA action is being prosecuted. In other words, the potential liability seems manageable.

In addition the EPA Office of Enforcement has a special policy for small (de minimis) contributors. Although the de minimis contributor is expected to pay its allocated percentage EPA waives its legal rights to have the re-opener clause in its releases. In other words, if more contamination is found five or 50 years later, EPA cannot go back after that contributor. This approach has been endorsed by Congress in the SARA amendments. There is a statutory obligation now for EPA to grant that special arrangement to de minimis contributors.

In a hypothetical situation, if the contributor has liability in the site of $1,000 EPA might ask for a premium payment of several hundred dollars and write the release. The small contributor would have no further liability. Dougherty stressed that as a practical matter it is "very unlikely" that collection program sponsors would have significant liability under CERCLA.

Finally, while looking at the potential legal liability for HHW management, people must also look at the liabilities associated with not establishing HHW programs. Of the 850 sites across the country on the national priorities list roughly 165 are landfills. In enforcing CERCLA against landfill operators those operators are typically state and municipal governments. For example, in New Castle, Delaware EPA is going against the county and three other parties. Limited information is available in this case. The county is the key defendant. EPA is going to get the $15-30 million that it is expected to cost to clean up the site. The county is understandably concerned about this.

Effective management of legal liabilities requires consideration of the option of removing the hazardous component from the municipal waste stream to the extent possible, thereby eliminating the potentially devastating long-term liability of landfill clean-up under CERCLA.

## HOUSEHOLD HAZARDOUS WASTE: AN INTERNATIONAL PERSPECTIVE

Gerhard Vogel, Assistant Professor, Institute for Technology and Commodity Science, University of Economics and Business Administration, Vienna, Austria

To begin his presentation Vogel defined HHW as that small share of household waste, amounting to 1-2 percent, that renders waste treatment essentially difficult or makes certain methods of waste treatment, such as composting, impossible. He cited figures on the amounts of HHW, resulting from two studies. The first, done in the Federal Republic of Germany, was a market-oriented study, listing all kinds of hazardous waste. It found 0.20 to 0.30 kilograms per person per year of hazardous waste from households. This is a net figure, including recycling activities. The gross amount is 2 kg per inhabitant per year. From commerce the amount came to 1.8 kg/person per year, of which 1.5 kg is utilized (such as waste oil), leaving 0.3 kg/person per year from commerce and industry going into the waste stream.

The other study, done in Vienna, Austria, was a thorough household waste analysis which found 2-4 kg/person per year of hazardous products in household waste (gross). Associated with the problems of HHW are a lack of information about it, a lack of legislation, no controls or monitoring systems for these small amounts, and the extensive distribution of the materials in the waste stream.

In discussing the negative effects of hazardous substances in household and commercial waste, Vogel gave a listing of some of the problems resulting from hazardous substances in household waste:

utilization of waste materials (Example: PCB-containing carbon paper)

waste incineration (Example: the mercury in the battery share)

composting (Example: zinc in the battery share)

the treatment of leachates from sanitary landfills (Example: hydrocarbon from solvents)

landfill of demolition waste (Example: paints and solvents)

For these reasons almost all Organization for Economic Cooperation and Development (OCED) member countries have special hazardous waste programs. These countries are:

Austria
Denmark
France
Federal Republic of Germany (FRG)
Italy
Japan
The Netherlands
Sweden
Switzerland
United Kingdom
United States of America

Another example of the detrimental effect of hazardous substances is the problem of composting in a two-container system. In this system, there is one container for secondary raw materials and one for residual components, mostly kitchen and garden waste. The content of the second container is to be composted. This is almost impossible without the separate collection of hazardous materials especially for the cadmium, zinc, and mercury containing wastes.

In referring to Exhibit 4 Vogel pointed out that new Swiss regulations say that there can only be 400 parts per million of zinc if you want to use compost for agricultural purposes. This means a recycling rate of 70 percent if mixed waste is to be composted or the organic materials have to be separately collected.

Strategies for the elimination of hazardous substances from household and commercial waste, shown graphically in Exhibit 4A were listed as:

1. Legal prohibitions:

   Food laws

   Waste regulation(prohibition of certain substances)

   Air pollution regulation(prohibition of the incineration of certain substances)

2. Guidelines for product design and production planning(reduction of the mercury content in batteries in Switzerland, for example).

3. Reduction of hazardous substance content in commodities(as in FRG and Switzerland).

4. Labeling of products to give objective information to the consumer for his purchasing decision:

   positive labeling of environmentally sound products, containing no hazardous substances (e.g., Environmental Label, FRG)

   negative labeling of products, indicating hazardous components.

   neutral instructions for use and disposal.

5. Information for the consumer in his purchasing decision that explains appropriate handling methods during and after the use of hazardous substances.

6. Labeling of packaging systems (e.g., Japan)

Exhibit 4

**In Austria, the following example applies:**

| Recycling rate for consumer batteries ( % ) | Zinc content in household waste from consumer batteries ( ppm ) |
|---|---|
| 0 % | 1.200 |
| 10 % | 1.080 |
| 20 % | 960 |
| 30 % | 840 |
| 40 % | 720 |
| 50 % | 600 |
| 60 % | 480 |
| 70 % | 360 |
| 80 % | 240 |
| 90 % | 120 |
| 100 % | 0 |

Austrian limit for zinc in compost: ppm
Swiss limit for zinc in compost: ppm

**Tab.1:** **The Zn content in household waste from the battery share dependent on the difference in collection and recycling efficiency**

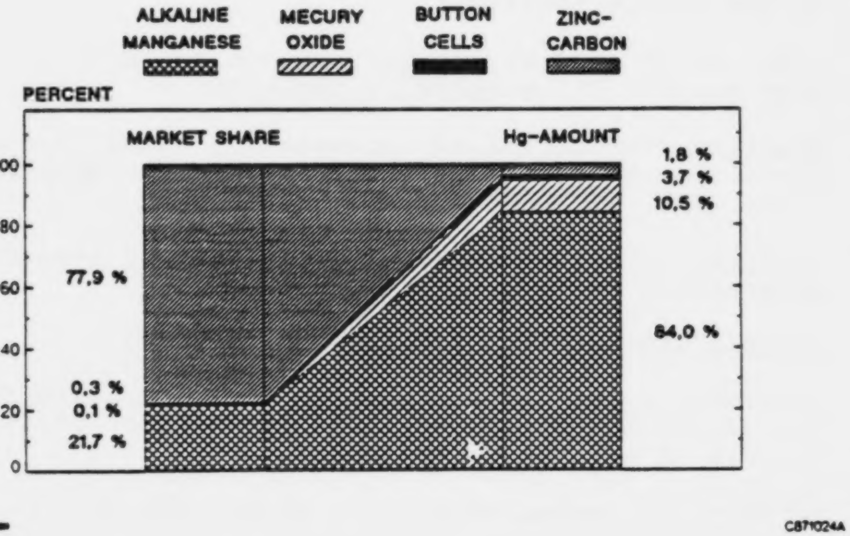


**Fig. 1:** **The mercury amount in different battery systems in household waste**

Source: Gerhard Vogel

Exhibit 4A

The small amount of products containing hazardous substances in household waste contributes to the various problems related with household hazardous waste:

- Lack of information
- Lack of legislation
- No control and monitoring systems
- Extreme distribution in waste streams

## 3. Strategies for the Elimination of Hazardous Substances from Household and Commercial Waste

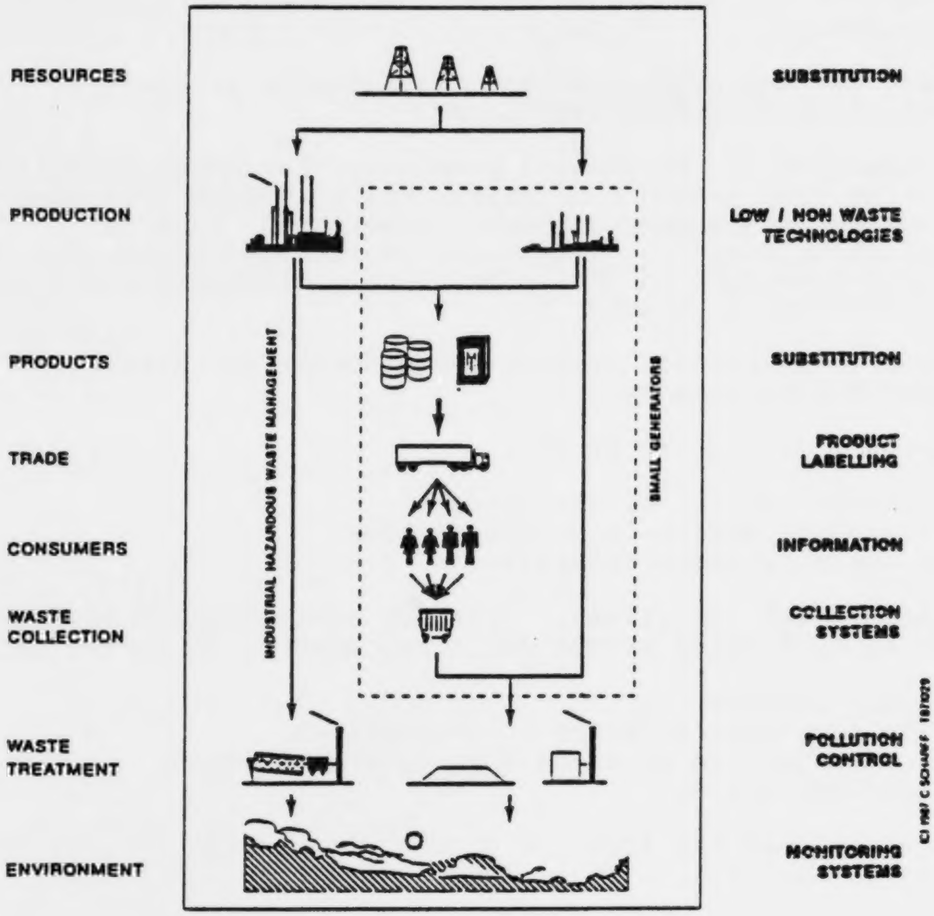

RESOURCES
SUBSTITUTION
PRODUCTION
LOW / NON WASTE TECHNOLOGIES
PRODUCTS
SUBSTITUTION
TRADE
PRODUCT LABELLING
CONSUMERS
INFORMATION
WASTE COLLECTION
COLLECTION SYSTEMS
WASTE TREATMENT
POLLUTION CONTROL
ENVIRONMENT
MONITORING SYSTEMS
INDUSTRIAL HAZARDOUS WASTE MANAGEMENT
SMALL GENERATORS

**Fig. 2:** **Steps in the distribution and elements of a strategy for the elimination of hazardous substances**

Source: Gerhard Vogel

7. Obligation of producer/retailer to take back the product (e.g., FRG, Switzerland, Austria).

8. Obligatory-retailer take-back (e.g.,in Austria there is a cardboard box placed in stores where customers can return used batteries and drug stores take back old drugs).

9. Substitution:

   Required action, (e.g., for PVC in Switzerland, Austria)

   Legal regulation on fluorochlorinated hydrocarbons in spray cans. (This is a problem in Europe, not in the United States)

10. Fees for products containing hazardous substances (the amount of the fee according to the content of hazardous substances).

11. Taxes for the production and distribution of products containing hazardous substances.

12. Information on the general problem of hazardous materials. Quoting from Sweden's hazardous waste program:"All measures based on spontaneous consumer cooperation, such as purchasing behavior, participation in collections, etc, are highly dependent on the information and consciousness of the individual consumer."

13. Creation of deposit systems for products containing hazardous substances.

14. Separate collection of HHW:

    Deliberate action of retailers
    Private collection in municipalities
    The municipalities themselves

15. Under market conditions, voluntary environmental measures can be of limited effect and often need to be backed by law.

    Deposit schemes
    Compulsory participation in collections
    Legal obligation of traders to take back goods
    Sales limitations

Vogel shifted the focus to discuss collection systems for the separate collection of household hazardous substances.

The separate collection of hazardous substances is a passive reduction method. Many of the above mentioned strategies are active reduction methods, i.e., their application prevents or reduces the production of hazardous substances and are therefore more effective than separate collection. On the other hand, the implementation of these reduction methods takes a very long time, whereas separate collection can be carried out immediately. Separate collection is beneficial because:

- it keeps harmful substances away from household waste
- although it is passive, it is quickly implemented
- it is free of charge, easy and unbureaucratic
- it strengthens public consciousness of the problem.
- it has an environmentally positive effect on consumer behavior.

Those who become aware of hazardous substances and take them to the collection facility become familiar with all the connected problems and are much more prepared to accept alternative products that might be of lesser convenience.

Dr. Vogel described the characteristics of the two-systems used to collect hazardous substances. Refer to Exhibit 4B.

1. "Bringing Systems" (i.e., substances are brought to a collection point)

   - Permanent Installations
     - permanently open collection facilities
     - collection by retailers
     - municipal facilities, e.g., waste treatment, landfilling, machine parks, etc.
     - public collection containers for special hazardous substances such as batteries, etc.
   - Regular Collection
     - hazardous waste collection facilities
     - collection stops in regular collection pick-ups, e.g., Sweden
     - quarterly collection at certain collection spots
   - Occasional Collection
     - local collection initiatives, once or twice a year
     - special dates for the collection of hazardous waste

2. Collection Systems

   - Special collection tours
     - on demand
     - regular
     - For example, in Sweden citizens can call waste management and they will come to collect materials, either on a regular or a special collection pick-ups.
     - Integrated collection in the framework of public cleansing and separate collection of secondary raw materials, the hazardous waste container in the waste or waste material container, e.g., five liter plastic containers or the hazardous waste bag in the waste or waste materials container, e.g., yellow sacks.
     - supplementary devices for collection pick-ups (a rack system such as they have in Sweden where homeowners can bring substances that have been specially packed and place them in a special rack on the collection truck.)

Exhibit 4B

## 4.4 Collection Results of some Hazardous Waste Collection Systems

| System | Participation (% households) | Efficiency ( % ) | Specific Quantities (kg/inh.year) | Location |
|---|---|---|---|---|
| BRINGING SYSTEM | | | | |
| Occasional collection day | | | 0.01 - 0.03 | Munich, FRG |
| | 0.62 | | 0.03 - 0.11 | Vienna, A |
| Regular collection days | | | 0.7 | Province, A |
| Weekly at collection sites | | | | |
| high population density | 20 | 37 - 60 | 0.8 - 1.4 | Vienna, A |
| low population density | | | 0.12 - 0.24 | Vienna, A |
| COLLECTION | | | | |
| Special collection tour | | | | |
| City | 8 - 15 | | 1.0 | Detmold, FRG |
| Country | 21 - 73 | | | Detmold, FRG |
| Integrated bag systems | | | 0.14 | Province, A |

Tab. 3: Results of different hazardous waste collection systems

| | Specific Quantity (kg/inh.year) | Share ( % ) | Efficiency ( % ) |
|---|---|---|---|
| Waste Batteries | 0.19 | 15.1 | 55.4 |
| Waste Drugs | 0.15 | 11.9 | 50.0 |
| Waste Oil | 0.26 | 20.6 | |
| Edible Oil | 0.20 | 15.9 | |
| Others (e. g. paints, solvents) | 0.46 | 36.5 | |
| Total | 1.26 | 100.0 | 36.7 - 57.9 |

Tab. 4: Results of the separate collection of household hazardous wastes in Vienna, 1986

Source: Gerhard Vogel

The psycho-social and socio-economic incentives for the creation of hazardous waste collection systems are important considerations. Public information and motivation is an essential element in the successful organization of hazardous waste collection. This information should contain:

What: a list of materials
How: instructions on how to transport materials to collection points or how to dispose of materials in an environmentally appropriate way
Where: collection spot
When: hours that the facility is open
Why: the effects of hazardous substances and the reduction of those effects by having separate collection of materials

In conclusion, Vogel described the international experience.

AUSTRIA:

- Legal prohibition of waste incineration in households
- A Federal Waste Management Plan is being elaborated which is similar to the regulation in the FRG
- Bringing systems: permanent, regular (based on provincial regulation), occasional
- Collection systems: integrated hazardous waste bag, integrated hazardous waste container
- Collection of laboratory wastes from schools
- "Button" cell battery recycling plant in operation
- Recycling plants for waste batteries and fluorescent tubes are planned

DENMARK:

- Legally ordered collection sites in every community
- Advertising and information by communities
- Priority given to local awareness
- Agreement between communities and paint shops to take back old paints and solvents
- Physicians can take their waste to drug stores where it is collected and brought to the hazardous waste incineration plant

FEDERAL REPUBLIC OF GERMANY(FRG)

- Legal option to prohibit and reduce the use of hazardous substances, taking back obligation, labeling systems
- Bringing systems: permanent, regular (based on Provincial obligation), occasional
- Collection systems: integrated hazardous waste bag, integrated hazardous waste container
- Button cell recycling plant (recently closed down)
- Recycling plant for fluorescent tubes
- A positive labeling system for materials that have no hazardous waste content

JAPAN

- Battery collection system and a mercury recycling plant in operation

SWEDEN

- Regular collection tours
- Upon-demand collection of hazardous waste in special packs together with household waste collection
- Collection of waste batteries in public collection boxes
- Old drugs and clinical thermometers taken back in drug stores
- Operation of a button cell and fluorescent tube recycling plant

SWITZERLAND

- Legal limitation of hazardous waste contents, in such things as batteries, compost, etc
- Obligation of retailers to take back old batteries

UNITED KINGDOM

- Special collection of asbestos-containing materials
- Old drugs taken back in drug stores
- Special exchange system for button cells in hearing aids organized by the Department of Health and Social Security
- Collection of laboratory waste from schools without charge and from other laboratories with charge

# STATE-SPONSORED COLLECTION PROGRAMS

Felix Harvey, Division of Air and Hazardous Materials, Rhode Island Department of Environmental Management.

Harvey's division enforces the Rhode Island hazardous waste regulations and has responsibility for the HHW program, otherwise known as "Household Toxic Clean-Up Days." Toxic Clean-up Days are one-day collection centers which are state-organized, advertised, staffed and funded. Currently Rhode Island's is the only ongoing fully state-run program. Florida has had a state-run program which is temporarily on hold due to delays in legislation.

## BACKGROUND OF THE PROGRAM

RI Toxic Clean-up Days started in 1984, inspired by citizens' calls and news of HHW collection programs in Massachusetts, Florida and elsewhere. No funding or legislation was passed specifically for the program. Several state officials, including the Director of the Department of Environmental Management, thought it was a good idea to initiate such a program. One reason for the program was to provide homeowners who needed it with a good alternative for the disposal of hazardous wastes. Another reason was the belief that the program might help out in the long run as an educational tool to make people aware of the issue of siting of hazardous waste facilities.

In the fall, of 1984 five collection days were planned. The set-up used at that time is the one still used today. It is a basic drive-through system. Signs direct traffic in. Cars are received at a check-in station where surveys are completed and educational materials are handed out. Cars proceed to the waste-receiving area. Staff unload materials from vehicles and place it on the appropriate tables. These tables separate the waste-receiving area from the waste-handling area where wastes are bulked or packaged by contractor personnel. Cars exit from the waste-receiving area once wastes have been unloaded.

Since the start of the program in 1984 there have been 20 collections, including seven in 1987. There were roughly 700 participants per year for 1984 and 1985. In 1986 there were 1000 participants, and in 1987 1,400.

## SCHEDULING AND SITING

Future programs are planned for May and September 1988. In general, they occur on three consecutive Saturdays, in different locations, spring and fall. In selecting sites consideration is given to the areas of the state which are densely populated or to towns where there has been no recent nearby collection. The town administration is advised of the Division's intent to conduct a Toxic Clean-up Day, and suggestions for locations are sought. Town or school lots are often considered. Once an accessible site is located which can accommodate the anticipated traffic flow a formal proposal is submitted to the town manager.

## PUBLICITY

Traditionally, publicity begins three to four weeks prior to a given collection day. All newspapers receive press releases, as do TV and radio stations. Harvey has done radio and TV interviews. A public service announcement (PSA) video is aired on the local cable channel. Posters are made up and distributed to grocery stores, banks and other high-traffic locations. Flyers are sent. Copies of the "Hazardous Wastes from Homes" magazine (a publication of Enterprise for Education, Santa Monica, CA) are distributed free of charge at collection centers. An active citizens group had 160,000 pamphlets printed entitled "How to Handle Household Hazardous Products." These pamphlets are distributed to school children prior to Toxic Clean-up Days in their locale.

## CONTRACTORS

From 1984 through 1986 RI dealt with one contractor for the collections they conducted. The state and the original contractor learned together how to conduct HHW collections. When the Request for Proposal (RFP) for the new Household Toxic Clean-up Day contract went out for bid it lacked many of the details that had been developed over the years for running the program.

A new contractor was hired under a slightly faulty contract. The new company had done many town collections (in Massachusetts) and had developed their own methods for handling the wastes collected. RI's original contractor had bulked most liquids, including pesticides and corrosives. The new contractor would only bulk paints and waste oils. RI had done some neutralization of corrosives on site. The new contractor would not do that. Their policy was based on the company safety policy. Except for paints and oils, everything else was lab-packed.

Another sticky issue in regard to the new contractor was the disposal option. The contractor, having its own permitted hazardous waste transfer facility, wanted complete control over the destiny of the wastes. As a regulatory agency of the state the Division of Air and Hazardous Materials wanted to specify disposal options with preference for permanent disposal technologies, with an emphasis on treatment, such as incineration and neutralization. With a fixed price contract, it was advantageous for the contractor to select the least expensive disposal option, such as the cheapest available landfill. The state worked out an arrangement whereby they agreed to pay additional disposal costs in excess of bid quotes if they were provided with complete waste tracking, including certification that the HHWs had been disposed of at a permitted facility in the preferred manner. Costs with the old contractor had run $50 per person. The new contractor cost $100-200 per person.

A faulty RFP can cause problems. It is important to be clear and explicit and to have everything in writing. In RI the new revised RFP specifically states the disposal requirements: incineration of pesticides, when applicable; neutralization of corrosives and reactives, for example. Basically, the state prefers treatment over landfilling, but recognizes that some wastes can only be landfilled. A description of packaging techniques is requested for all waste categories. Bulking is specified for paints, oils and asbestos.

## RECYCLING

The state would like to recycle the materials received at collection centers. There are tables for unopened materials. Experience has shown that people who come to collection centers come to throw things away, not to "shop". Batteries are taken to a salvage company where $.50 per battery is paid.

## STAFFING

The majority of the check-in and waste-receiving staff are State of RI employees. This is an efficient system since, as employees of the Division of Air and Hazardous Materials, they are dealing with hazardous waste on a daily basis. Volunteers have been used to staff check-in stations and the recycling tables. They do not handle hazardous wastes. More use of volunteers in the future is being considered.

## TYPES OF WASTES COLLECTED

A typical collection day in RI is run from 8:30 am to 3:30 pm. All RI homeowners are entitled to bring HWW to a collection center. All types of wastes are accepted, although people have been sent home with tires. No one is turned away, unless they come to a collection center after the drums have been sealed (after 3:30).

## FUNDING

The program has the advantage of not being limited by budget. The first two years of the program were funded by the Rhode Island General Fund. In 1986 the Environmental Response Bond Fund was passed, a $5 million fund for environmental clean-ups. The Toxic Clean-up Days are not the fund's only purpose, but are well provided for by this means.

## LIMITATIONS

All hazardous wastes are taken. Exceptions, which are mentioned in collection day advertising, are radioactive wastes and explosives. No radioactive wastes have been received. The State Fire Marshall's Office has agreed to come to take away explosives that might come in. RI will accept dioxins and other hard-to-dispose-of items. Those wastes are presently stored at a permitted facility and a "rental" fee is paid. They will remain there until a new disposal location opens up. This is an agreement included in the new RFP.

## SUMMARY

The popularity of the HHW collection program is likely to continue. Improvements can always be made. There are still no good options for those people who need to dispose of hazardous waste immediately. The biggest complaint received is from the citizen who cannot believe that the state does not have a place where materials can be taken on an ongoing basis. The educational program and the publicity need improvement. Finally, a big issue is what to do with wastes from SQGs. The state's policy is not to accept any business waste. All of these problems contribute to improper disposal. Attention needs to be given to dealing with SQGs and to the development of permanent collection sites.

## STATE MATCHING GRANT COLLECTION PROGRAMS

Leslie Lewis, Citizen Participation Coordinator, Connecticut Department of Environmental Protection.

Lewis delivered Barbara Kelley's prepared remarks. Barbara Kelley, Public Participation Manager, Office of Safe Waste Management, Massachusetts Department of Environmental Management was originally scheduled to speak. Lewis graciously filled in and supplemented Kelley's prepared remarks with information about the CT program.

A number of states have chosen to use grant programs to encourage HHW collection programs. Connecticut, New Hampshire, Wisconsin and Massachusetts were highlighted in the presentation.

### SOURCE AND AMOUNT OF FUNDING

Connecticut The state legislature has appropriated money for the state's program from general funds. This has amounted to $554,000 over a three year period. More is anticipated for the next fiscal year.

New Hampshire The program receives $100,000 per year from the state's hazardous waste clean-up fund. That fund, in turn, receives money from generator fees and fines.

Wisconsin Funding has been a line item in the state budget. Originally proposed at $100,000 per year, the appropriation was cut to $50,000 a year for two years. During this fiscal year, the line item was vetoed by the governor so there is currently no money available for the program. A bill has been introduced in the legislature to re-fund the program.

Massachusetts .The program is run with funds from a legislative appropriation which provides grants to cities, towns, and regional planning agencies for the purpose of groundwater conservation and protection. During fiscal years 1986 and 1987, $490,000 was available to fund programs. During FY 88, the Office of Safe Waste Management will have approximately $425,000. This will exhaust the funds in the appropriation so that the future of the program depends on further legislative appropriations or development of some other funding mechanisms.

### APPLICATION DISTRIBUTION AND MATCHING MECHANISMS

Connecticut Applications were initially sent to a wide audience including selectmen, health departments, conservation commissions and regional planning agencies. All were notified of the availability of funds and funding requirements. Currently communities just apply to the state and are funded on a first come, first served basis. The state provides 50 percent reimbursement of actual collection costs after the event. To date, they have been able to fund all applicants. Because of increasing participation and costs the state may not have sufficient funds to assist all applicants by Spring 1988. To date, the legislature has been supportive of the program and there is optimism for future funding.

New Hampshire Requests for proposals (RFPs) are sent to many groups including mayors, selectmen, solid waste districts, and conservation commissions. The RFPs are sent twice a year. New Hampshire's grant amounts to 15¢ per capita, but in no case pays more than half of the costs of the collection. Some publicity costs associated with collections have been allowed. All applicants have been funded.

Wisconsin The availability of grant money was advertised through a publicity network for municipalities. The state offers a 75 percent match with a maximum grant of $15,000. The money can be used for collection costs and education. More applications were received than could be funded. Seven grants were awarded on the basis of commitment and the existence of a local network to organize the collection.

Massachusetts Applications were sent to mayors, boards of selectmen, and boards of health in all communities. The first application, sent in February 1986, provided for a 50 percent match for the total estimated collection costs. The estimates for various population ranges were included in the application. Communities were expected to have raised their half of the estimated costs before the application was submitted, or to provide documentation that it was included in the warrant for their town meeting by the time of the application deadline. The first application also provided a formula to reimburse regional planning agencies to assist communities with organization, education, publicity, contract negotiation and administration. Another provision allowed communities to use 25 percent of the estimated collection costs for a clean-out of high school chemistry laboratory storerooms with that amount being reimbursed by the state. All publicity, traffic control, and cost overruns were the responsibility of the community.

The current application was also sent to mayors, boards of selectmen and boards of health. This year's program provides 50 percent of the estimated collection costs for communities not previously funded, 35 percent for those who have received funds in the past, 8 percent of the estimated collection costs to reimburse regional planning agencies for administrative assistance given to communities which request their help. There is no provision for the high school chemistry lab clean out because this program was difficult to administer in the context of the household program. The Office of Safe Waste Management still regards this as a valuable program and is providing technical assistance to schools and other laboratories under its SQG program. (Connecticut is also looking at ways to run high school lab clean outs as a separate program.)

In addition to providing funds for traditional one-day collections, the current application also provides for innovative pilot projects which provide for alternatives for longer term solutions such as permanent collection stations, curbside pick-up, pre-registration and collections for specific wastes.

In the initial phase, Massachusetts received applications from 155 of the Commonwealth's 351 cities and towns. One hundred thirty-one communities were funded before the appropriation was exhausted. The remainder were placed on a waiting list and will be funded in this fiscal year. Because regional collections were encouraged by the criteria on which the awards were made, the 131 communities funded translated into 59 collections. Applications are being reviewed for the second phase and are expected to exceed the funds available.

## CRITERIA, GUIDELINES AND LIABILITY

Connecticut The state approves all final plans. These plans must include site set-up, traffic flow, use of volunteers, responsible parties, and general organization. These detailed plans are as much for the town's safety and planning purposes as they are for the state agency. The community is also required to submit a copy of the signed contract with the hauler. After that they are sent a very simple grant application. In Connecticut the transporter is the generator, which is legislated by statute. Liability is a muddy issue everywhere. Some communities have asked for additional insurance through their transporter's policy. Other communities have decided that the risk associated with holding a collection is no greater than that from not taking care of the waste.

New Hampshire There are some guidelines and minimum requirements. Communities are required to conduct significant public education. The state suggests that the communities negotiate with the transporters to assume generator status and that collections be held on municipal property. No schools, farms, or businesses are allowed to participate. The state provides a model contract for municipalities. The community has a temporary generator ID number for the day.

Wisconsin Awards were based on the applicant's ability to demonstrate local support and level of organizational skill. The collections were usually held on municipal or county property such as highway garages, fairgrounds, and public works departments. Because the strength of the county system differs across the state, some collections were countywide while others were local. In some areas, regional planning agencies assisted communities. The municipality secured a temporary generator ID number for the collection.

Massachusetts The funding criteria under the first application gave priority to regional collections, first-time collections, and communities in which the local match was already available. The first application required a minimum population base of 12,000 except under certain circumstances. The state also required that each community conduct at least two educational events, set up an organizing committee, provide for emergency response and collect data. A licensed hazardous waste transporter had to be used and the transporter assumed generator status. Liability insurance was occasionally provided by transporters by adding a rider to their insurance policies. While it may still be an option, it may become too expensive to be an alternative. A one-day rider may cost as much as $2,500. Most communities are trying to control their liability through careful set-up and operation of collections. A temporary ID number, usually secured by the transporter, is used for each collection. For those applying for the optional high school clean-out, workshops for teachers on proper management of hazardous materials and waste were required.

The current application gives priority to communities not previously funded, those who regionalize, and those collections which make an effort to include communities with less than 3,000 people in a larger group.

In September, 1987, Massachusetts sponsored a statewide HHW conference with the League of Women Voters. It attracted local officials, environmental and civic groups and concerned citizens. The agenda included workshops on organizing collections, education, liability, special wastes and other issues.

## FUTURE PLANS

Connecticut A questionnaire has been sent to all communities, those which have and those which have not had collections. Those that have never held a collection cite cost as the major obstacle to having a program. One more year of the matching grants program is expected. After that, it is unclear how they will proceed.

New Hampshire The HHW program will continue as it is for the next year. However, the state is doing research on the effectiveness of the program to determine what direction it should take and is also investigating permanent collection stations.

Wisconsin There is no money for the program this year. They are working on a pesticide/agriculture program which may feed into the household program.

Massachusetts The program will continue at least through this fiscal year. Future funding will depend on legislative action. There is great interest in the program so there is a high level of confidence that some level of funding will continue in the next fiscal year. Currently, several pilot projects are in various planning stages. Martha's Vineyard and Williamstown are involved in setting up permanent collection centers. Other areas are waiting for those to go into operation to assess their costs and patterns of use.

A regional planning agency in western Massachusetts is in the planning stage of setting up bi-monthly collections which would serve households and very small quantity generators who will be able to self-transport small amounts of waste under new regulations which should go into effect in January 1988. The state's Pesticide Bureau is also involved in the planning process to determine whether it will be possible to include farmers at some future point. Prices for disposal by businesses and farmers would be advertised in advance. While there would be an expense for them, the planning agency would like to assess what effect the convenience of having bi-monthly collection would have on regulatory compliance for these groups.

## GENERAL CONCLUSIONS

In general, the experience of these states has indicated that the increase in public awareness is resulting in increased participation and amounts collected. Rural areas remain a problem for some states because very small communities cannot support costs of collections and travel distances are great. Permanent collection centers are being investigated in several areas. In Massachusetts, front-end separation of hazardous waste from the solid waste stream is being considered as one of the funding criteria for solid waste grants under the Solid Waste bill which is currently being discussed in the legislature.

Matching grant programs can encourage communities to hold collections and provide guidance and emphasis on education through the funding criteria. Local contribution to the collection costs gives the community a vested interest in its success. In Massachusetts, communities which have held successful collections usually continue to hold collections with or without state funds. The local contribution may be an obstacle for less affluent communities, especially in periods of increased strain on local budgets.

Demographics also play an important part in the success or failure of programs. In Massachusetts, it is expected that future programs will differ depending on the area of the state which they serve. For this reason, the state works closely with local and regional groups to find solutions which best fit the circumstances in their areas.

The sources of information for each of the states covered were Leslie Lewis: CT, Donna Reardon: NH, Elaine Andrews: WI, and Barbara Kelley: MA.

## CORPORATE SPONSORSHIP

Ryan Delcambre is Issue Manager, Dow Chemical, U.S.A., Midland, MI.

Delcambre works full-time on the development and implementation of a multi-media waste reduction program for Dow's manufacturing areas in the United States.

HHW collection programs are consistent with the overall waste management philosophies at Dow, hence the interest of the company in these programs. Delcambre explained that there are two main types of HHW collection programs in which the corporate community is involved, and they differ in terms of who participates. They are:

> Corporate-sponsored collection programs for company employees and retirees.
>
> Corporate-sponsored collection programs for communities, generally ones near a corporate facility/plant.

Delcambre stressed that his list was by no means the definitive list for all companies involved in corporate sponsorship of collection programs. Among those mentioned were Monsanto, Sperry Rand, BFI, Chem-Waste Management, Chemical Processors, and GSX. He chose to highlight the collection program organized by Hercules, a chemical company in Wilmington, DE, as an example of a program for company employees.

### A CORPORATE-SPONSORED COMPANY PROGRAM

Hercules scheduled its first program for employees and retirees for June 20, 1987. They received comments afterward that the timing was poor. Spring or fall was felt to be a better time to clean out/clean up garages, etc.

As a pilot program the Hercules program was closely monitored by the Delaware Department of Natural Resources, the Governor's Office, and the League of Women Voters. They were looking to see the feasibility of such programs throughout the state.

Rollins Environmental was hired to do the packaging, transportation and disposal of all wastes collected. Hercules used its own research EPA ID # for hazardous waste, and the waste collected was manifested by Hercules.

Publicity for the program was done by a company newsletter, sent to 5,000 company employees and retirees.

Collection program data:

- 140 cars came to the collection center, a 2.8 percent participation rate.

- 4,000 lbs. of waste were collected.
- Total cost was $16,500.

This figure includes fixed overhead costs, publicity, safety equipment and contractor fees. Costs were an average of $118 per car or $4.10 per lb. Delcambre noted that the state was completely surprised by the cost of the program. Hercules, however, was pleased with the success of the program and will probably continue it.

Breakdown of waste collected:

- 90 percent of cars carried RCRA hazardous waste, i.e., the waste would otherwise be subject to RCRA amendments if they were generators.

-50 percent of cars carried waste oil
-50 percent " " " paint
-50 percent " " " aerosol cans
-20 percent " " " batteries

Honeywell does a similar program in the Twin Cities area in MN. Their program is primarily for their employees, however they also help other programs through monetary grants.

## CORPORATE-SPONSORED COMMUNITY PROGRAMS

Pointing out that Dow is the company he knows best, Delcambre outlined Dow's efforts. They provide complete support for their programs. They supply the funds, the resources, the staff. All liabilities are assumed by Dow and all disposal is on Dow's own sites.

Dow has been active at its Midland MI division from 1984 through this year. They have had programs in Louisiana and Texas since 1985. These are areas where Dow has a large manufacturing presence. Dow also has its own waste management facilities in those locations.

In becoming involved Dow sees the handling and hierarchy (reduction, recycling, treatment, and disposal) of management as being the same for HHW as it is for Dow's handling of its hazardous waste on their production sites.

For source reduction it is recommended that "you buy what you need" and "use what you need."

Recycling and reuse can be achieved through paint and pesticide exchanges, or neighbors can give neighbors materials they were not able to use completely themselves.

Education is the primary reason for Dow's involvement. Dow wants to help make the public aware of the safe use, handling, and disposal of household materials. One of the educational initiatives, started by Dow, is a program for fifth and sixth graders. These programs are in the schools in the three areas where Dow holds its collection programs.

COLLECTION PROGRAM PARTICIPATION DATA:

Number of Households Participating

| Texas |  | Louisiana |  | Michigan |  |
|---|---|---|---|---|---|
| '86 | '87 | '86 | '87 | '86 | '87 |
| 46 | 159 | 326 | 244* | 456 | 237 |

*The drop in participation is probably not accurate. The count of participation was done by an exit survey. Not all cars stopped. The likely number of cars is probably twice the number shown.

EXHIBITS 5, and 5A show comparison data.

In 1986 the cost to collect and dispose of a pound of hazardous waste: $1.92. In 1987, the cost was $2.37 per pound. It should be noted that these wastes are being managed and disposed of in Dow's own incinerators.

COLLECTION PROGRAM LOGISTICS:

Location: Dow used shopping centers throughout the local areas for their collection centers.

Staff: Dow employees were used to collect, transport and manage the waste.

Liability: Dow was responsible for all liability.

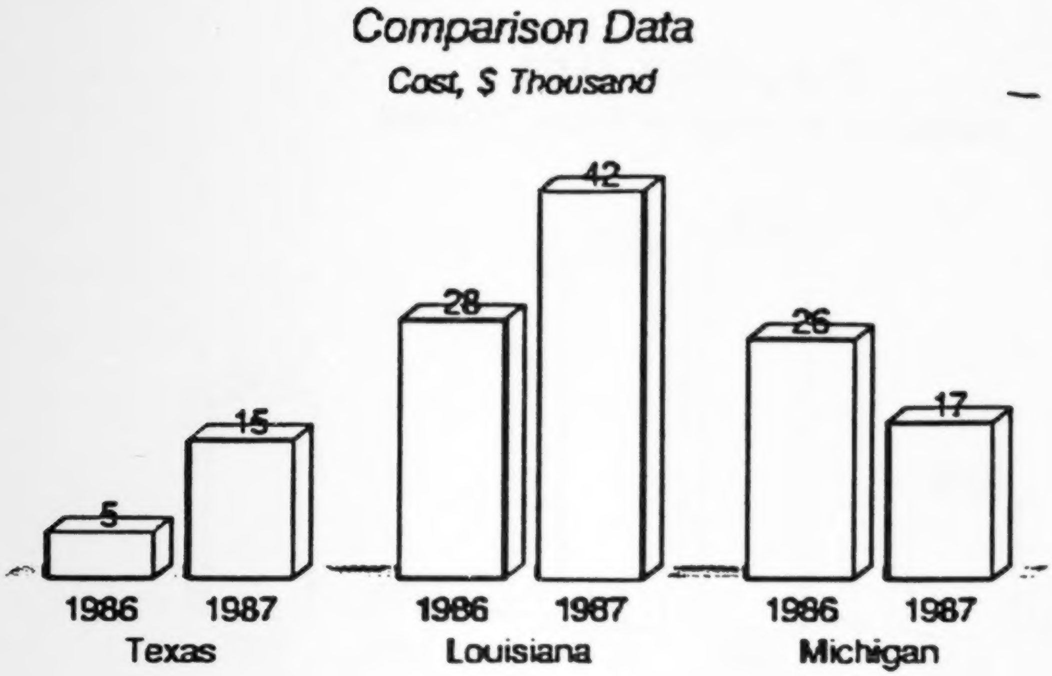
Publicity: Dow used all available media as well as door hangers to advertise the collection events. Dow included a list of wastes which they would not accept in all of their publicity. They did not accept dioxins.

Disposal: Dow handled all disposal.

DISINCENTIVES FOR SPONSORING COLLECTION PROGRAMS

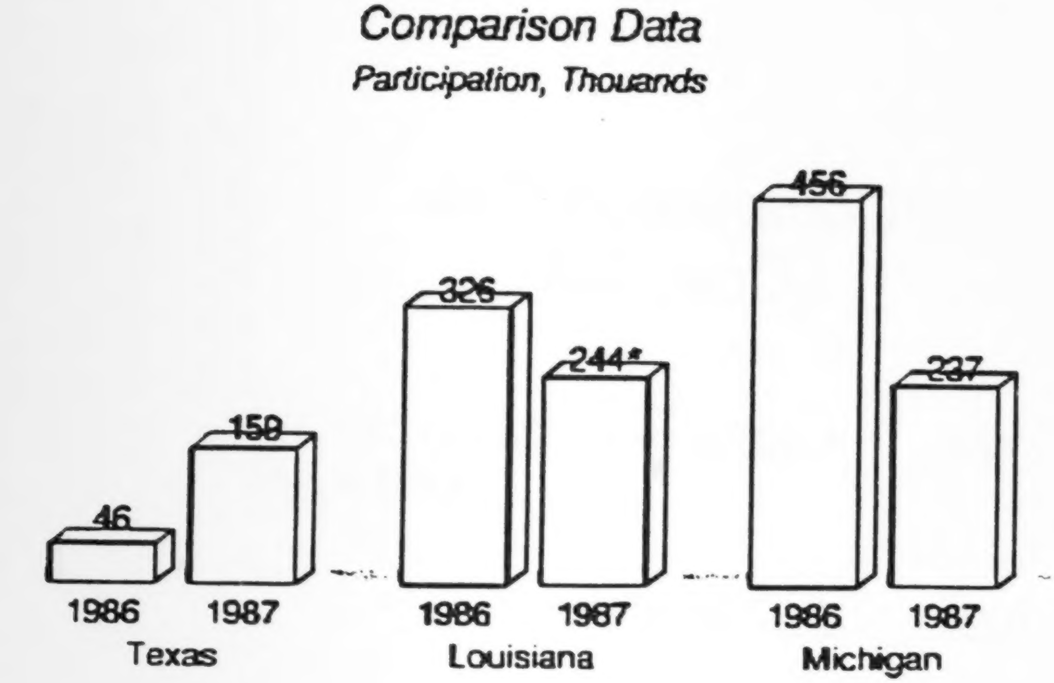
State regulations or laws are a major impediment. An example is a law which was passed in Texas in February 1987. This law would require a mini RCRA part B permit for every collection. (The '87 Dow program in Texas was grandfathered). This would have the effect of adding two man-months for every program Dow holds. They are considering holding the programs on their own facilities thereby eliminating the need for a permit. Another possibility is to make a permanent disposal site on Dow's facility so that people could come any time.

Exhibit 5


Comparison Data

Cost, $ Thousand

Cost includes disposal and publicity


Comparison Data

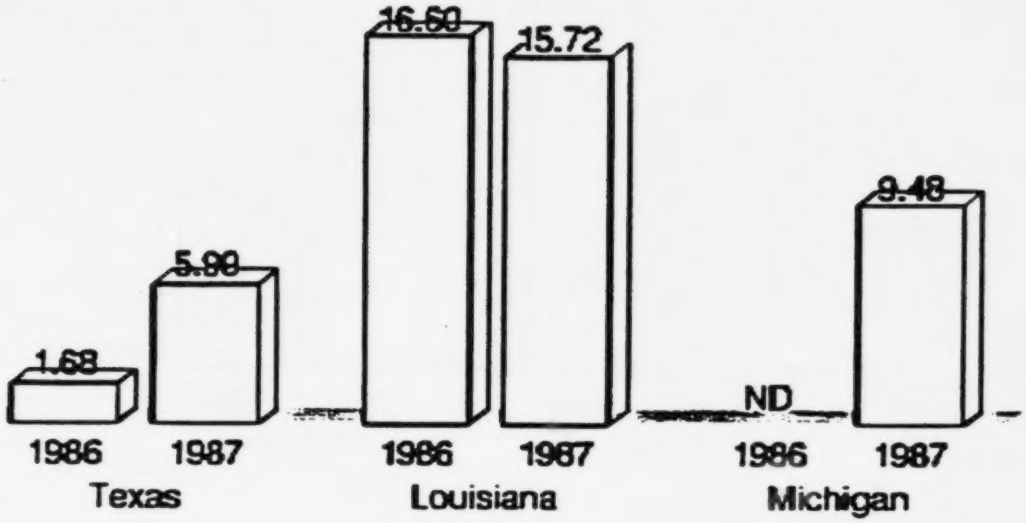
Participation, Thouands

Source: Ryan Delcambre, Dow Chemical U.S.A., October 1987

Exhibit 5A

## Comparison Data

*Thousands of Pounds of Waste Collected*



## *Comparison Data*
## *Cost, $/lb*

| | |
|---|---|
| **1986** | **1.92/lb of waste (excluding Michigan)** |
| **1987** | **2.37/lb of waste** |

Source: Ryan Delcambre, Dow Chemical U.S.A., October 1987

## REGIONAL PROGRAMS

Emy Meiorin, Senior Environmental Engineer, Association of Bay Area Governments, Oakland, CA.

Meiorin began by referring conference participants to Exhibit 6 which was included in the conference packet.

Her remarks augmented the information presented in the printed materials. Of the potential 16 jurisdictions, 12 cities participated in the regional collection. Association of Bay Area Governments (ABAG) felt that this was a good success rate. The joint planning committee for the regional collection met one to two times per month. This allowed for consolidation and reduction of duplication in the planning efforts. It also provided encouragement and education for the ten cities which were new to collection programs and which were eager to learn. ABAG had data which was helpful for projections on costs and waste amounts. (Exhibit 6A ).

### ADVANTAGES OF THE REGIONAL APPROACH WERE:

A single hazardous waste contractor was hired for all collections. This gave the program uniformity and also permitted economy of scale.

The funding of the collections was an aspect that ABAG was able to assist with by helping the communities to develop funding mechanisms. For example, they looked at A.B. 1809 (the state legislation) which provided a way to get the solid waste fee structures to fund collections.

Cost-sharing was helpful to small cities. Often the start-up cost can be as much as $10,000 before a single drum of waste is collected. Each city self-funded the program, however ABAG contributed $10,000 in seed money to each collection event and the equivalent of $3,000 to 5,000 in printing and advertising costs. The remainder of the cost was paid by the cities and towns on a cost-sharing formula. ABAG suggested basing the contribution of each community on its population, however the cities and towns said that they wanted to pay on the basis of the actual number of people who showed up on the collection day. The cities and towns then paid on the basis of the percentage of the community participating.

As a result of this approach, record-keeping needed to be done. A questionnnaire was used which asked people which city or town they came from and the waste was sorted accordingly. "Out-of-area" households' wastes were received and prorated to each city according to the same percentage as their own people came in.

Because of ABAG's involvement there was a stipulation that county residents could go to any of the four collection events within the county. Cities were free to accept people from

Exhibit 6

## REGIONAL HAZARDOUS WASTE COLLECTION PROGRAM
## for Households and Small Generators, Alameda County, Calif.

**Participants:**

Association of Bay Area Governments (ABAG)
P.O. Box 2050, Oakland, CA 94604-2050
Project Manager: Emy Chan Meiorin, (415) 464-7941
Alameda County – Dept. of Environmental Health (ACDEH)
Alameda County – 454,000 households (pop. 1.2 million)
14 cities and 2 unincorporated districts
(represented by 2 Special Sanitary Districts)

**Initial Project Funding:**

Federal Clean Water Act – Section 205(j) grant ($142,500)
ABAG/Alameda County Health Dept. matching funds ($47,500)

**Schedule:**

Planning Period: November 1986 – May 1987 (7 months)
Household Collection Program operation: May – July 1987
Small Generators Program: May – October 1987
Analysis of Results/Project Report: August 1987 – March 1988

**Rationale for Regional Program:**

1. A Regional Program would facilitate joint-city planning, reduce work duplication and encourage/educate cities conducting first-time collection programs; cost-sharing would allow participation by cities that otherwise could not afford a collection program;
2. ABAG would develop projections of waste generation and program costs based on data compiled from the San Francisco Bay Area;
3. With 4-6 planned collection events, one hazardous waste disposal firm would be contracted to cover all the events – thus providing program uniformity and achieving an economy of costs for the individual participating cities/districts. ABAG would act on the cities' behalf to contract with a hazardous wastes disposal firm for the Program;
4. ABAG would organize and provide a county-wide publicity program that would be more cost-effective than a city-by-city effort;
5. ABAG and the cities would develop a solid waste fee mechanism–based on recent State legislation (AB 1809)–to finance the collection program;
6. ABAG would fund $10,000 towards each of the 4-6 collection days; the remainder of the costs would be borne by each city in proportion to the actual number of households participating from each city at each event;

**Funding Methods for Collection Program:**

Total collection program costs: $258,500
ABAG subsidy: $40,000
Local city/district share: $218,500

| | |
|---|---|
| Solid waste rate structure | 10 cities |
| City General Fund | 2 cities |

**Publicity Methods:**

| | |
|---|---|
| Garbage can notices | 300,000 |
| Notices at landfill | 10,000 |
| Brochures (hand distributed) | 130,000 |
| Paid Advertisements | 9 Newspapers |
| Press releases, news articles, etc. | |

**Collection Day Statistics:**

Traffic volume: 237 to 845 vehicles per event (total: 2,300 vehicles)
Participants: 297 to 1,002 households per event (total: 1,900 households)
Haz. waste collected: 105 – 335 drums per event (total: 1,014 drums)
Latex paint collected: 9 to 32 cu.yds. per event (Total: 91 cu.yds.)

Source: Emy Meiorin, Association of Bay Area Governments

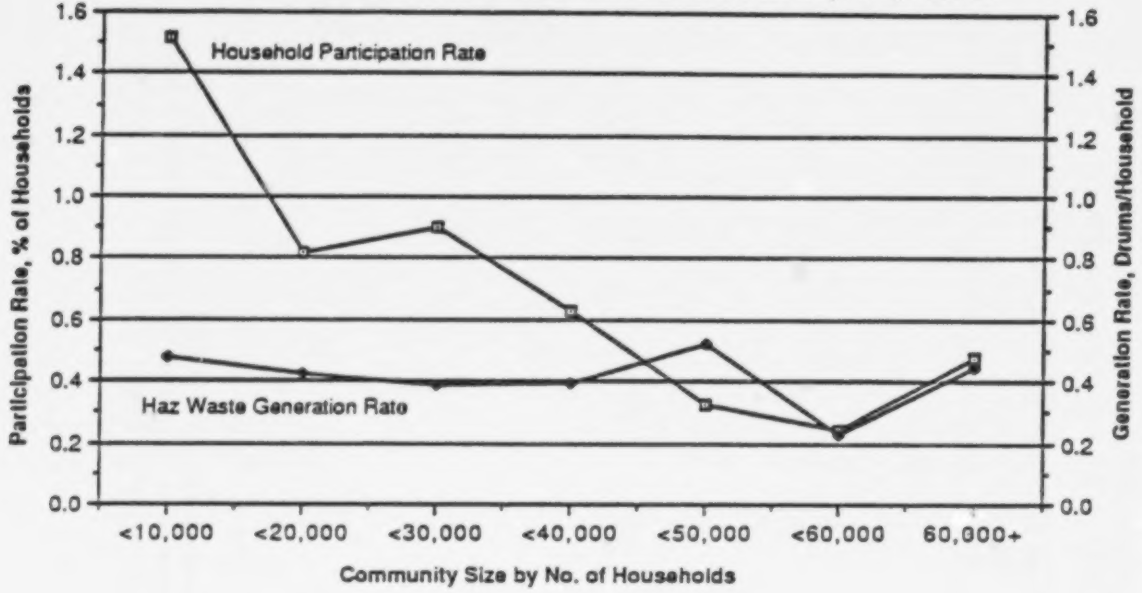
Exhibit 6 cont'd

**Regional Hazardous Wastes Collection Programs**

Association of Bay Area Governments, 1987

## Figure 1. Community Size and Collection Event Participation

Based on data from 40 Collection Events in the San Francisco Bay Area, 1983-87



## Figure 2. Disposal Costs vs No. of Drums Collected

Based on data from 40 Collection Events in the San Francisco Bay Area, 1983-87

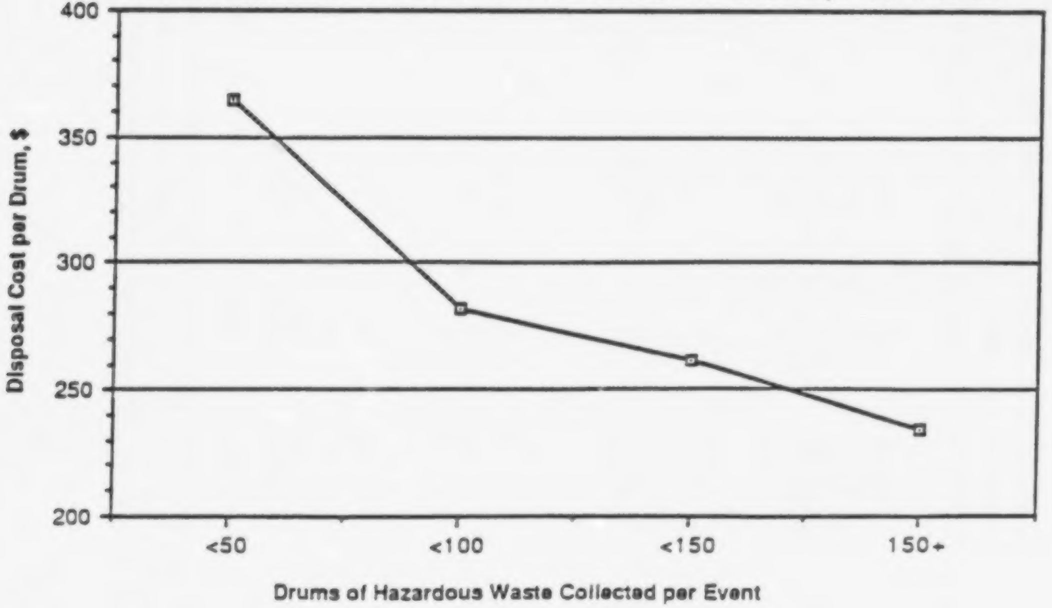


Exhibit 6 cont'd

## ALAMEDA COUNTY PILOT HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM
## WASTE AND COST ESTIMATE BY CITY (June-July 87)

| SubArea and City | Number of Households 1/1/87 | Predicted Hshld Participation Rate, % | Actual Hshld Participation Rate, % | Haz. Waste Volume, Drums | Avg. Haz. Waste Volume Drums/hshld | Latex Paint Volume, Cu yds | Avg. Paint Volume Cu yds/hshld | Disposal Cost*, $/drum | Avg. Hshld Cost $/hshld | Pro-Rata Hshld Cost** $/hshld | Equiv. Cost† per Particip. Hshld $/hshld |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Area 1*** | | | | | | | | | | | |
| Oakland | 146,859 | 0.4 | 0.26 | | | | | | | $0.33 | |
| Alameda | 29,011 | 1.0 | 0.62 | | | | | | | $0.78 | |
| Piedmont | 3769 | 1.0 | 2.39 | | | | | | | $3.03 | |
| *Subtotal* | 179,639 | 0.51 | 0.36 | 330 | 0.51 | 30 | 0.05 | 247 | $0.46 | | $127 |
| ***Area 2*** | | | | | | | | | | | |
| Berkeley | 45,422 | 1.2 | 1.60 | | | | | | | $1.41 | |
| Albany | 6,932 | 1.2 | 2.93 | | | | | | | $2.59 | |
| Emeryville | 2,725 | 1.0 | 0.15 | | | | | | | $0.13 | |
| *Subtotal* | 55,079 | 1.19 | 1.69 | 335 | 0.36 | 20 | 0.02 | 244 | $1.50 | | $88 |
| ***Area 4*** | | | | | | | | | | | |
| Fremont | 54,133 | 1.0 | 1.19 | | | | | | | $0.81 | |
| Union City | 14,879 | 1.0 | 0.99 | | | | | | | $0.68 | |
| Newark | 11,366 | 1.0 | 1.11 | | | | | | | $0.76 | |
| *Subtotal* | 80,378 | 1.00 | 1.14 | 238 | 0.26 | 30 | 0.03 | 258 | $0.78 | | $68 |
| ***Area 5*** | | | | | | | | | | | |
| Livermore | 18,828 | 1.0 | 1,03 | | | | | | | $1.13 | |
| Pleasanton | 15,212 | 1.0 | 0.37 | | | | | | | $0.41 | |
| Dublin | 5,709 | 1.0 | 0.53 | | | | | | | $0.57 | |
| *Subtotal* | 39,749 | 1.00 | 0.71 | 96 | 0.34 | 9 | 0.03 | 316 | $0.77 | | $109 |

* Disposal costs include: site set-up, site operations, disposal of hazardous waste/latex paint and incineration of ORM-A.

** The participating cities agreed, by contract, to allocate costs according to the actual proportion of city participants in each Area Collection Event

† Average disposal cost if calculated only for actual number of households participating in each Collection Event.

Exhibit 6 cont'd

**ABAG References for Regional Hazardous Waste Collection Program For Households and Small Generators of Hazardous Waste**

**The Disposal of Hazardous Waste by Small Quantity Generators - Magnitude of the Problem,** June 1985, 166 pages -- Evaluates problems associated with the improper disposal of hazardous waste from households and small business. Presents results from a survey of 300 households and 10 small business categories. Discusses effects of improper disposal to refuse workers and the environment. **CAT. NO. P855009HAZ** ($6.25 + $2.50 postage and handling)

**Overview of Hazardous Waste Collection Programs in the San Francisco Bay Area,** April 1987, 20 pages -- Overview of 40 household hazardous waste collection projects conducted from 1983 through 1986. Includes statistics on participation rates, waste generation rates, disposal costs and financing methods. Also included is a description of the Alameda County Pilot Program and hazardous waste disposal issues. **CAT. NO. P87003HAZ** ($5.00 + $1.50 postate and handling)

**A Characterization of Hazardous Household Wastes in Marin County, California,** (report to ABAG) by W. L. Rathje, D. C. Wilson and W. W. Hughes, The Garbage Project, Department of Anthropology, University of Arizona, Tucson, July 1987, 53 pages -- Special report on an actual collection, sort and analysis of types and amounts of hazardous materials found in household refuse. Results indicate what proportion of household solid waste may be hazardous and estimated household generation rates. **CAT. NO. P87004HAZ** ($4.00 + $1.25 postage and handling)

*The above publications may be ordered by contacting the ABAG Publications Department, P.O. Box 2050, Oakland, Calif. 94604-2050 (415) 464-7941.*

Exhibit 6A

## Household Hazardous Wastes Collection Programs, San Francisco Bay Area, 1983-1986

| Date | Collection Area | Households in Service Area* | Households Participating | Participation Rate, % | Drums Collected | Generation Rate Drums/Hshld | Disposal Cost, $ | Unit Cost $/Drum | Publicity Method | Financing Source |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 86 | PaloAlto | 23,600 | 224 | 0.95 | 109 | 0.49 | 19,100 | 175 | Utility Bills | Utility Surcharge |
| 9 85 | Union City/Fremont/Newark | (77,700) | 278 | 0.77 | 98 | 0.35 | *30,597* | *312* | Garbage note | Garbage Fees |
| 9 85 | Fremont/Union City/Newark | (77,700) | 320 | 0.77 | 123 | 0.38 | *38,403* | *312* | Garbage note | Garbage Fees |
| 9 86 | Hayward | 37,560 | 418 | 1.11 | 94 | 0.22 | 30,300 | 322 | Direct Mail | City General Fund |
| 9 86 | Morgan Hill/Gilroy | 14,670 | 100 | 0.68 | 52 | 0.52 | 13,000 | 250 | Utility Bills | City General Fund |
| 9 86 | Santa Clara | 34,900 | 252 | 0.72 | 123 | 0.49 | 39,805 | 324 | Utility Bills | Utility Surcharge |
| 10 86 | Sunnyvale | 46,000 | 221 | 0.48 | 80 | 0.36 | 22,100 | 276 | Direct Mail | City General Fund |
| 10 86 | Petaluma | 14,000 | 120 | 0.33 | 49 | 0.41 | | | Garbage note | Garbage Fees |
| 11 86 | Mt.View/LA/Cupertino | 42,650 | 244 | 0.57 | 108 | 0.44 | 22,000 | 204 | Media | City General Fund |
| 1 87 | PaloAlto | 23,600 | 222 | 0.94 | 116 | 0.52 | 25,530 | 220 | Utility Bills | Utility Surcharge |

*Based on 1983, 1984, 1985, 1986 Department of Finance data.

**Disposal cost does not reflect donation of services/materials; unit cost not applicable

*Note: Estimated costs are in italics. Collections for Martinez/Richmond (4/85) and Union City/Fremont/Newark (9/85) include est. value of donated materials and/or services*

Source: Emy Meiorin, Association of Bay Area Governments

other areas. One of the problems with strictly "local" programs is people coming from adjoining communities.

## COSTS

The question was how much will a regional collection program cost? A formula was worked out based on three factors:

1. Household participation rate
2. Hazardous waste generation rate
3. Average disposal cost

(See Exhibit 6B)

Exhibit 6B

## Alameda County Pilot Household Hazardous Waste Collection Program
## Projected Waste Generation and Project Costs, April 1987

| SubArea and City | Number of Households in 1980 | Projected Participation Rate* % | Projected Number of Participants | Projected Waste** (Drums) | Disposal Cost††, $ @$250/drum |
|---|---|---|---|---|---|
| ***Area 1*** | | | | | |
| Oakland | 141,657 | 0.4 | 567 | 170–227 | |
| Alameda | 26,517 | 1 | 265 | 80–106 | |
| Piedmont | 3.763 | 1 | 38 | 11–15 | |
| *Subtotal* | 171,937 | | 869 | 261–348 | $65,000–87,000 |
| ***Area 2*** | | | | | |
| Berkeley | 44,704 | 1.2 | 536 | 161–215 | |
| Albany | 6,855 | 1.2 | 82 | 25–33 | |
| Emeryville | 2.132 | 1 | 21 | 6–9 | |
| *Subtotal* | 53,691 | | 640 | 192–256 | $48,000–64,000 |
| ***Area 3*** | | | | | |
| Hayward | 34,600 | 1.2 | 415 | 125–166 | |
| Castro Valley | 17.191 | 1.2 | 206 | 62–83 | |
| *Subtotal* | 51,791 | | 621 | 186–249 | $48,000–62,000 |
| ***Area 4*** | | | | | |
| Fremont | 44,125 | 1 | 441 | 132–177 | |
| Union City | 11,925 | 1 | 119 | 36–28 | |
| Newark | 9,216 | 1 | 92 | 28–37 | |
| *Subtotal* | 65,266 | | 653 | 196–261 | $49,000–66,000 |
| ***Area 5*** | | | | | |
| Livermore | 16,230 | 1 | 162 | 49–65 | |
| Pleasanton | 11,317 | 1 | 113 | 34–45 | |
| Dublin | 3.954 | 1 | 40 | 12–16 | |
| *Subtotal* | 31,501 | | 315 | 95–126 | $24,000–32,000 |
| ***Area 6*** | | | | | |
| San Leandro | 27,204 | 1 | 272 | 82–109 | |
| San Lorenzo | 17.632 | 1 | 176 | 53–71 | |
| *Subtotal* | 44,836 | | 448 | 135–179 | $34,000–45,000 |

* Rates based on data for similar-sized communities from Figure 4.

**Projected waste volumes = No. of households x projected participation rate x waste generation rate. A waste generation rate of 0.3–0.4 drums per household was drawn from Figure 4.

††An average disposal cost of $250/drum was derived from Table 5. Final per drum disposal costs will vary depending on the actual number of drums collected. Disposal Costs do not include publicity costs which will be covered by ABAG under this project, nor City staff and volunteer labor which are donated.

Source: Emy Meiorin, Association of Bay Area Governments

Making a estimate of the participation rate is difficult. ABAG looked at 40 collection programs. They used a rate of .4 percent to 1.2 percent as an average, based on the size of the city.

## FINANCING

The financial issue is the most frequently asked question about the collection program. ABAG's target was to spread the contractor's service charge out over all the cities' households, at least as much as could be done. California's legislation gave cities the authority to use a surcharge on their garbage fees or to increase the rate structure for their garbage fees to pay for this type of program. The law went into effect January 1987. ABAG was anxious to try out this new option. As it turned out 13 out of the 16 jurisdictions had a garbage franchise with the same firm. This was helpful because they could approach the one company to work things out.

A joint petition to the local solid waste rate review board which sets the rates for the area requested either utilization of the existing reserve fund from garbage fees or enactment of a surcharge to pay for the program. ABAG wanted to do this in behalf of all cities in the area so that they would be allowed to use one of these funding mechanisms. This was a record-breaking occurrence because it brought the board together to review this petition at one time and was done in hopes of setting a precedent that cities could come in the future and petition to use the same mechanism to pay for future programs.

## OPERATION OF THE PROGRAMS

Generally the largest city in the jurisdiction was designated as the lead city, and was named the hazardous waste generator for record-keeping.

Usually there were two or three cities per collection day.

The contractor was responsible for getting the EPA ID # and the CA Department of Health Services variance for running the program.

The contractor also prepared:

- Site plan
- Emergency plan
- Contingency plan

The contractor carried the general liability for the event. ABAG requested that the contractor have $1,000,000 coverage and that the cities be added as additionally insured. The liability only included the collection site and it did not cover environmental damage liability. In addition, the contractor had to carry a performance bond equal to one and one-half times the cost of the collection day.

Sites for the collection varied. They ranged from a utility company (PG & E) corporation yard, a fire department training center, a racetrack parking lot, and a little-used industrial area.

Publicity was done in conjunction with the garbage company. Since ABAG was working with them they relied primarily on garbage can notices (bright yellow notices punched out to hang on garbage can handles) placed there by garbage workers. The notices were generally put out one to two weeks before each collection.

A unique feature of their program was their method of handling latex paint. They received 90 cubic yards of latex paint. Watertight dumpsters with a 20 cubic yard capacity (approximately 3000 gallons of paint) were hauled to the municipal landfill as a part of this pilot program. The contractor prepared a clay pad, dumped out the paint onto it, ran over it a couple of times with a bulldozer to crush the cans and to allow the paint to be released. The paint was then allowed to air-dry for one to two weeks and then the dried paint was landfilled.

The regional water quality control board wanted to be sure that a serious water contamination problem was not being caused. They required soil tests before the paint was dumped, after it was dumped as well as tests of the paint itself. Preliminary results are still being analyzed and so far they look quite promising. It is hoped that this method will set a precedent such that the regional board will allow this method to be used in other collections.

The cost was $40 per cubic yard to dispose of the paint.

## THE FUTURE

### Where to from here?

This is a one year pilot program with the hope to encourage communities to continue collection programs on a sub-regional basis. One objective is to give communities the opportunity to learn for themselves what is involved in a collection program so that they know how to set it up. The communities will also gain experience with the solid waste financing mechanism which allows cities to go to the garbage review board. Garbage companies are currently offering optional spring clean-up programs billed to the cities on an individual city basis. The hope is that possibly cities will add HHW collection programs to their contracts with the garbage companies. The new RFPs would be amended to include this extra service.

ABAG will continue to organize periodic meetings for HHW updates. In the Bay area collection programs are sponsored by a range of agencies, either the fire department, public works department, recycling center, etc. Because these groups do not work full-time on HHW collections it is hard for them to keep up with the various developments in the field. ABAG sees the value of a centralized system to keep people informed.

## PAINT COLLECTION

Linda G. Pratt, Hazardous Materials Specialist, Hazardous Materials Management Unit, Division of Environmental Health Protection, San Diego County Department of Health Services, San Diego, CA.

The following is an overview of San Diego County's efforts to collect and recycle paint.

The HHW program in San Diego County is administered by the County Department of Health Services' Hazardous Materials Management Division. Funding for the program is shared by the City of San Diego through the Water Utilities Department and by the County Department of Public Works through the Solid Waste Division. Two key components of the program, education/publicity and hazardous waste storage/disposal, are provided through service contracts. The Environmental Health Coalition is responsible for the educational component. Appropriate Technologies II (APTEC II), a licensed waste hauler and storage, treatment and disposal facility, is responsible for storage and disposal of the hazardous wastes.

The program sponsored ten "Paint Collection" events in FY 86-87 at different locations throughout the county, coordinated by the Hazardous Materials Management Division. The events were held on Saturdays. School parking areas were primarily utilized because of ample space and easy access. The county is required to apply for a treatment, storage and disposal facility permit variance prior to holding collection events. They made application to the CA Department of Health Services and were given what is called a "blanket" variance for the collection events. The county provides the state with the date, location and a plot plan of each site as well as a standard safety plan. The county has taken it upon itself to prepare a site-specific emergency contingency plan. It is prepared for review with all staff at the paint collection events. This plan lists the local hospital, fire department, and all the critical information which might be needed in an emergency. They also notify the local fire department when a collection event is scheduled to take place.

Staffing requirements of the paint collection events generally consist of eight County Environmental Health Services' staff, ten APTEC II employees, and occasionally high school student volunteers arranged for by the Environmental Health Coalition. Currently in FY 87-88, the program utilizes a work crew provided at minimal cost by the County Probation Department.

Although the events were advertised for paint collection, residents brought other types of HHW. All of these were accepted by the program. Each waste type other than paint was appropriately segregated and lab-packed. The paint was loaded on to a roll-off container At a later date at APTEC II the paints were segregated, as either solvent-based or water-based, by light or dark color, prior to consolidation into 55-gallon drums. The combined volume of paint collected in FY 86-87 was approximately 6,800 gallons. Of that total, approximately 65 percent (approximately 4,420 gallons) was water-based paint.

The county feels strongly that, when possible, household hazardous "wastes" should be recycled and reused as "material." This premise is based on a sound environmental and economic perspective. Therefore, the county arranged to have the water-based paint reprocessed by a major paint company. It was packaged into five-gallon containers for reuse in the community. The cost associated with reprocessing the paint was approximately $2.00 per gallon. This product is an interior/exterior paint recommended for rough surfaces. The original intent was to make the reprocessed paint available to government agencies or nonprofit organizations. As it worked out, the only non-profit which expressed any interest was the Boy Scouts. There were a number of factors that impeded their success. First of all, the color selection was limited to brown or beige. Secondly, the quality of the paint was questioned, especially by government agencies. An attempt to get the Navy which has a large presence in the San Diego area to use the paint failed. The reprocessed paint did not meet military specifications. The labor costs associated with a painting project significantly outweigh the cost of materials. Consequently, there was an unwillingness to try the reprocessed paint.

After much deliberation, it was decided to include the paint in the county coperative auction, which is held quarterly and is open to the public. All of the reprocessed paint was purchased by eight private contractors for an average price of $12.00 per five-gallon pail. The contractors that were contacted after the auction were pleased with the product.

There are a number of options that are currently being evaluated to improve the cost-effectiveness of the paint recycling program. In affluent areas, paint often comes in to collections in unopened or nearly full cans. At the collection event, one and five gallon paint containers that are at least 75 percent full and are clearly labeled are not consolidated into 55-gallon drums. Rather, they will be featured in a "Paint Exchange," which is an approach that the community may find more desirable. A second option is filtering the paint at APTEC II, rather than paying for reprocessing the paint on the outside, and enhancing the color selection by doing a more extensive segregation by color.

There are regulatory disincentives. As of September 1, 1987 the solvent-based paint collected exceeds the VOC (volatile organic chemicals) air pollution control limitation for California. Therefore, a market outside of California must be established. If not, the solvent-based paint will have to be incinerated. A random sampling of drums of both the unprocessed solvent-based and water-based paint was conducted, and laboratory analysis was performed for heavy metals and semi-volatile organics. All of the water-based paint samples exceeded TTLC [Threshold Toxic Limiting Concentration] limitations for mercury. For that reason, landfilling of the paint is not being considered as an option.

In conclusion, the county is challenged with improving the quality of its HHW recycling program. One of the key components in meeting that challenge is enhancing the ability to exchange ideas and concepts with other programs throughout the nation.

## ONE DAY, MULTIPLE SITES

Richard Conlin, Projects Director, Metrocenter YMCA, Seattle, Washington.

Conlin opened his remarks by issuing a challenge. The challenge was to beat the record set on May 30, 1987 in Seattle, when, according to Conlin, they had the largest HHW collection day ever held in the world. On that date 4,091 households disposed of their HHW at four sites in the Seattle/King County area.

Conlin said that the key to their success was marketing. The event was not held as a public service, but rather as a serious attempt to get out to the public and try to involve them in solving the problem of HHW. There were three goals in putting together the event. The goals were to:

1. Involve a significant number of people and get a significant amount of waste out of the waste stream. In doing this they were able to make a difference to the environment and they were also able to impress the decision-makers for future policy-making.

2. Promote cooperation. There were 14 governmental units involved in the effort. They contributed staff and funds to the event. Another 12 governmental units contributed publicity. Four chemical companies donated all of their labor as well as providing discounts for other activities. The whole effort was pulled together and coordinated by a non-profit entity, the Metrocenter YMCA. This cooperative effort brought together governmental units which had been squabbling over solid waste issues. Additionally, the regional collection day idea allowed them to tap into a regional media market.

3. Empower people. An important goal was to overcome the feelings of alienation and helplessness that people have when they are trying to deal with issues of hazardous waste and toxic materials. It provided people with an opportunity to feel that they had done something to help deal with the problem.

### BACKGROUND

This was not the first collection event to be held in the Seattle/King County region. The Health Department has five locations around the county where they accept hazardous materials by appointment. An environmentally aware chemical company, Chemical Processors, Incorporated, opens its factory every Thursday, from ten to three, and accepts small quantities of household hazardous materials from the public at no charge. Three cities in the Seattle/King County area held HHW collection programs in 1985 and 1986.

Metrocenter YWCA's concerns are with community service and public involvement. They saw the HHW issue as an opportunity to bring people together to address the problem. The method they used was never to allow anyone to say no. In other words, they were polite, but persistent.

## METHODS

They developed planning agreements with all of the agencies and chemical companies involved. Three chemical companies handled the wastes. There were four contracts for the four sites. These contracts involved the chemical company, the city in which a collection site was located and Metrocenter, which served as the financial manager of the overall project.

The companies agreed to take on all of the liability for the operations, in addition to donating their personnel. The funding was taken care of by an assessment on each of the participating governmental entities. Projected costs were divided by population and a cost of seven cents per capita was assessed for the disposal of the waste. Personnel costs were covered either by the governmental units or the chemical companies.

The question of who would be the generator was an interesting one since there were four different sites. One city was willing to be the generator. At two sites the chemical companies were the generators. At the fourth site, a mythical entity "King County Household Hazardous Waste Round-Up," was the generator.

Different techniques were used by the different chemical companies for packing and disposing of the waste. They saw this as an opportunity to test cost and effectiveness. For example, one company took all the waste (except pesticides and extremely hazardous chemicals), dumped it into a big pit, crushed all the cans and drums, added absorbent, and allowed it to solidify. This resulted in a 20.5 ton block which was in turn disposed of at a hazardous waste landfill. This was an unusual and economical method.

Volunteers were used in significant numbers. Over 200 people were involved on the day of the collection event. One-third to one-half of them were volunteering their time. Volunteers came from government agencies, private corporations, and, of course, Metrocenter YMCA (both Board and staff members).

## RESULTS

A total of 4,091 participants brought in an estimated 117 tons of hazardous waste. As a result of the high level of participation they had problems with the operation of the event. There were long lines. At one site the line was an hour and a half long at one point during the day. In spite of this, people's responses were generally those of gratitude that the event had been put on. Certainly, in the future, they would hope for better management so such long waits could be avoided.

## EDUCATIONAL ACTIVITIES

They used pre- and post-event public opinion surveys. After the event, their survey showed an increase of 15 percentage points among people who could identify HHW. This showed that knowledge had increased by an equivalent of 40,000 to 80,000 households, probably as a result of their educational efforts. For publicity, they used TV Public Service Announcements, news releases, media events, and mailings. Although TV was good for getting attention, they found newspapers were more effective at bringing in people.

## FUTURE PLANS

They hope to tighten management and control costs. Two round-ups or their equivalent are planned in 1988. The cooperative program will be continued with the goal of a comprehensive system to be put in place.

Conlin also mentioned that a book describing the May 1987 event, "Head 'em up ...Move 'em out", will be available for $10 from Metrocenter YMCA, 909 Fourth Avenue, Seattle, WA 98104. (206) 382-5013.

## COLLECTION PROGRAMS AT A LANDFILL

Mr. William Merry, District Engineer, Monterey Regional Waste Management District.

The Monterey Regional Waste Management District (MRWMD) owns and operates and an 800 ton per day, Class III, municipal solid waste landfill located in Monterey County 120 miles south of San Francisco. The service area for the District is western Monterey County. The service area population is approximately 145,000. Refuse collection is by privately owned, franchised garbage companies. The district operates on a gross revenue of $1.8 million. This money is generated from a tipping fee which is paid by site users when they bring in their solid waste and dispose of their HHW.

In June 1986 the District was the primary sponsor of a one-day HHW collection event. Only 250 households (0.5 percent) turned out, filling 127 drums with hazardous waste. The cost of the one-day event was $54,000 which included over $20,000 for publicity. At the end of the day they began to consider if there could be a better way to spend $54,000 to provide a more comprehensive program to dispose of HHW.

At the same time landfills in CA are faced with developing a load-checking program. This is a regulation that has come down from the state under California Administrative Code, Title 23, Chapter 3, Subchapter 15, Discharges of Waste to Land. There is no definition as to what a load-checking program should entail. As some of the first sites in CA, out of the more then 2,000 solid waste landfills in the state, they had to come up with a program to develop a good load-checking system. They dovetailed load-checking for incoming loads of solid waste with the need for taking HHW on a regular basis.

They came up with a hazardous waste exclusion program. It is designed to take in only the household portion of hazardous waste. They do not accept SQG waste, except as it is found in the load-checking program and cannot be turned back.

This two-element program would provide householders with a disposal option five days a week throughout the year as well as satisfy the load-checking requirements. The Subchapter 15 regulations contained no definitions or discussion of what a load-checking program should contain. However, a draft version of U.S. EPA Subtitle D regulations released in April 1987 called for MSW landfills to have hazardous waste exclusion programs to include the following: random load-checking, inspection of suspicious loads, record keeping of inspections, training of personnel to spot hazardous wastes and provisions for handling hazardous wastes.

## PROGRAM START UP

The hazardous waste exclusion program is operated under the part-time supervision of an on-site engineer. A waste inspector was hired full time. However, only one-half of the inspector's time is devoted to hazardous waste activities.

Hazardous waste training was provided to all 20 site personnnel over a three-day period by an outside consultant. Day one was an overview of hazardous waste issues for all site personnel. Days two and three were attended by six key personnel. Topics covered included hazardous waste identification, handling and packaging as well as emergency response procedures.

Several permits were required before entering into the program.

1. U.S. EPA Generator Number
2. California Department of Health Services (DHS) variance from the requirements of a treatment facility.
3. DHS Extremely Hazardous Waste Permit.
4. The Central Coast Regional Water Quality Control Board issued a permit but did not approve the program.
5. The local Air District also did not issue a permit. They are sure to become involved in the future.

## PUBLICITY

The HHW portion of the program was operated for three months with only word-of-mouth publicity. With a staff of only one or two persons there was concern that the program become established before being overwhelmed by public participation. After three months, letters were sent to the public works departments of the eight member cities plus the county.

Currently, a four page informational article about the program is being prepared as an insert to the city of Monterey quarterly newsletter. When the program is a year old, more widespread publicity will be included in the newspaper. Radio and television publicity will follow that. Major periodic publicity would seem appropriate, perhaps on an annual basis, to sensitize people to hazardous waste issues.

## FUNDING

The program is funded from tipping fees charged to landfill site users. This fee is currently $5 per ton of incoming refuse. The $35,000 annual cost of the program amounts to $0.14 per ton of refuse.

Householders are charged the minimum site user fee of $5.00 when they bring in a maximum of five gallons or 50 pounds of HHW, along with 1,000 pounds of solid waste. The hazardous waste maximums (five gallons, 50 pounds) are set by DHS regulations.

A charge of $5 is about as much as people are willing to pay for this service.

Storage containers cost $3,000 and $5,000. Waste is segregated by major waste category. The waste inspector has a Haz-cat kit. On landfill property, they handle the materials not the homeowner. Batteries are recycled for 50¢ apiece.

## PROBLEMS

Insurance coverage remains intact and rates have not increased abnormally. There was initial concern that they would be increased.

Liability increased for the short term because District employees were handling hazardous wastes. Becoming an EPA generator caused concern since the District was now part of the cradle-to-grave chain. However, the long-term benefits of removing hazardous wastes from the municipal solid waste stream before they got to the landfill seemed to far outweigh the short term concerns.

The cost of $35,000 to carry out on on going program may seem high. However, the cost of the one day collection event was $54,000, and the cost of a groundwater clean-up can easily exceed $100,000 for only minor contamination problems. Therefore any effort to remove hazardous waste before it reached the landfill seems worth the cost.

Storage called for double containment. After one investigation, prefabricated chemical storage containers have proven to be very satisfactory.

Since the program has gone on line some new problems have arisen.

The on going program makes daily demands on staff time. Householders are requested to make appointments to bring in their hazardous wastes but do not always honor appointments. A specific one-hour period per day has now been designated when the waste inspector will be in the office to field telephone calls.

Abandoned household and small quantity hazardous waste is found on site once or twice a week. Typcially there will be several cans and bottles of household material in a cardboard box. Often it is left near the scale houue or the hazardous waste storage area where the householder feels sure it will be properly handled.

Households from outside the District are not allowed to use the program. Drivers' licenses are checked to verify residency.

Gardeners and landscapers have come with what they claim to be HHW from a client. In the past, they were turned away. Currently, arrangements are being made to verify the source of this waste and to accept it if the proper arrangements have been made beforehand with the homeowner.

Small businesses consistently inquire about using the program and attempt to bring in their hazardous wastes under the pretext of it being HHW. It is rejected when discovered and advice is offered on proper disposal. Too often the distinctions are not clear between household and small business hazardous waste and the wastes are accepted. Names and addresses are recorded for future reference.

Dioxin-containing wastes are not accepted. DHS and EPA need to work with treatment and disposal facilities to provide a solution for what can be done to deal with this problem. Currently EPA recommends these wastes be packed and stored until a disposal method is found.

## ADVANTAGES

A permanent HHW collection program responds to community needs for people who are moving or transient. Homeowners who are moving and those conducting garage or basement clean outs will have a disposal option throughout the year.

The landfill now has trained staff on site experienced in handling hazardous substances. This was not the case before the program was developed.

The hazardous waste exclusion program responds to State and Regional Water Resource Control Board regulations to develop a "load-checking" program. In addition, if a groundwater contamination problem should occur in the future, having a waste exclusion program in operation would be viewed favorably by regulators as well as the public.

The appointment approach to a permanent program allows time to carry out a telephone discussion about what wastes the homeowner has. They are encouraged not to bring latex paint, and to give away or use up other items such as paint, pesticides, or cleaners.

Another advantage of an ongoing program is the ability to take time to reduce amount of HHW that is lab-packed. Once material arrives at the site, the amount of hazardous material lab-packed is dramatically reduced from a similar amount collected at a one day event. Table 1 shows that a very low percentage of the hazardous material brought to the site by householders or found during load-checking is actually lab-packed. The remainder is declared non-hazardous as with latex paint; recycled as with motor oil, auto batteries; reclaimed as with wood finishes, which are sent away from the site under a bill of lading; or used up as with oil-based paints which are either used on-site or given to community groups. Photographic chemicals have been given to community colleges.

TABLE 1

Permanent Program Results in Lab-Packing Low Percentage of Hazardous Material Encountered.

| Generation Period | Number of Households | Hazardous Material Handled (tons) | Hazardous Waste Lab Packed* (tons) | % of Total That Was Lab Packed |
|---|---|---|---|---|
| 2/87-5/87 | 15 | 5.04 | 0.09 | 2 |
| 5/87-8/87 | 34 | 5.08 | 0.100 | 2 |
| 8/87-11/87** | 35 | 6.0 | 0.120 | 6 |

* Weight of container was included.

** Estimated

Source: William Merry, Monterey Regional Waste Management District

## SUMMARY

A permanent collection program for HHW has been very satisfactory from an operational standpoint. Citizens in the community concerned about proper disposal of their hazardous wastes now have a year round solution. There has been considerable interest by other landfills and municipalities about a similar program. Although this program works well at this landfill of 800 tons per day, as the size of the landfill decreases the cost may become more difficult to absorb.

Publicity and education about the issues surrounding hazardous waste need to be an integral part of a permanent program. Homeowners need to be educated to clean out their old hazardous wastes and to substitute alternatives.

The program does not accept small quantity generator (SQG) hazardous waste. Assistance needs to be given to the SQG to develop feasible solutions for their disposal problems.

Disposal solutions need to be found for dioxin-containing wastes. EPA and DHS need to work together to stimulate these solutions in the private sector.

California regulations governing landfill operations already call for "load-checking" programs. Proposed EPA Subtitle D regulations will be issued for comment later this year. They quite clearly call for a hazardous waste exclusion program at municipal solid waste landfills. Such a program would include staff training, emergency response procedures, load-checking, storage facilities and proper documentation.

## PERMANENT SITE

Kate Gage, District Coordinator, Refuse Disposal District Martha's Vineyard, MA.

Gage outlined the reasons a permanent program is being planned. Martha's Vineyard, a small island off the coast of Cape Cod, has a winter population of 12,000. In the summer the population is roughly 100,000, which creates severe waste disposal problems. The following are the major incentives to create a permanent collection system.

### GROUNDWATER PROTECTION

There are six towns on the island, each with its own landfill regulations. There is a high level of consciousness among officials and citizens that groundwater quality needs protection. In spite of this awareness, three towns' water supplies have been listed as "at risk" because of proximity of town wells to town landfills. The towns share a single aquifer.

### COSTS

All commodities come and go from the island by ferry boat. Steamship ferry service adds greatly to the cost of waste disposal. (Collection program costs on Martha's Vineyard are about double those in other parts of the country.) An ongoing program will allow waste removal by ferry to be less frequent and part of the regular schedule.

### INCREASED PARTICIPATION

In 1985 there was a 3 percent participation rate at the HHW collection event. There was concern about what the remaining 97 percent of the population were doing with its HHW.

### SPECIFICS OF THE PILOT PROGRAM:

Acknowledgement was given to Northeast Solvents, the waste hauler working with Gage on the permanent site, and to the model program in San Bernardino, California.

The pilot facility is called the "Harmful Household Materials Collection Station". Mid-November, 1987 is the target date for operations to begin. The facility will be a modified 38-foot metal decommissioned transport trailer.

The facility will be located at the waste water treatment plant outside of one of the island's three largest towns.

Materials collected and stored at the facility will be bulked or lab-packed drums of household chemicals.

Times that the facility will be open to the public will be six consecutive Saturdays during its first pilot phase.

Staffing will be done by the contractor's chemists, by island chemists trained by the contractor, and by volunteers.

Organics, solvents, paints and other materials will be lab-packed into 55-gallon drums. Batteries and waste oil are currently being collected under separate programs.

There are a number of sponsors. The first group to be responsive to the concern about household toxics was the League of Women Voters. Building on the League's foundation a small group of determined individuals formed themselves into the Hazardous Materials Coalition. One of their objectives was hazardous waste education. Members of the Coalition have ties to many island groups such as the Energy Resource Group, the Cooperative Extension Service, local fire departments and businesses, The Martha's Vineyard Greens Party, the Solar House Shellfish Hatchery, the Conservation Society, and the Regional Refuse Disposal District. It is the Refuse District which is providing the funding to implement the Coalition's plans. In MA, which lacks strong county government, the refuse disposal districts have broad powers including the ability to assess member towns for funds. Funding for the program in the current fiscal year is assured, but will be a major battle in the future. The soon-to-be constructed local Refuse Derived Fuel (RDF) incinerator will be accepting unregulated quantities of hazardous waste, including HHW for burning along with trash. The governing committee of the Refuse Disposal District already have questions about the HHW program. The questions raised by these policies demonstrate a real need for facts to help make informed decisions.

## COOPERATIVE VENTURE

Central to the method is the cooperative nature of the project. Without a licensed transporting firm willing to risk innovation the project would not be possible. The contractor, Northeast Solvents, has been very helpful in fine tuning the Martha's Vineyard program.

The contractor will assume generator status and liability for all materials accepted at the station.

The Contractor will train personnel, especially island chemists or technician/chemists to perform daily inspections and will be present at the station each day of its operation.

With Northeast Solvents' help a detailed work plan has been formulated which sets forth all the tasks involved:

Ordinary operating procedures
Materials handling procedures
Acceptance and appraisal of materials
Dealing with unacceptable materials
Lab-packing
Waste bulking
Drum labeling and sealing
Paperwork flow
Information to be furnished to local emergency responders
Health and safety procedures
Personnel training
Abandoned and unknown materials

The MA Department of Environmenment Quality Engineering has required a detailed emergency and contingency plan.

## PUBLICITY

The following methods will be used:

- Public service announcements
- Handouts at landfills
- Water booths and displays at county fairs
- T-shirts
- Brochure, "Are You Poisoning Yourself?"

## CONCLUSION

Why is Martha's Vineyard having a phased program? Their request for approval is for a pilot program of three or four six-week phases. This will make it possible to gather data on seasonal fluctuations, on participation rates, quantities collected and demographics. The hidden agenda is to give island residents a disposal alternative for household toxics over a one year period.

The pilot program will ensure an examination of priorities, such as the relationships between HHW, HHW municipal incinerators and economics. Based on what is learned they will use this information to establish a permanent collection station. In the future there will be an examination of adding facilities for very small quantity generators.

The foremost goal, however, is to have as many people as possible thinking about the hazardous materials they use, changing their behavior, and involving them in helping to solve disposal problems, through the means of source reduction, purchasing alternatives, recycling and citizens' action.

If individuals don't make the difference, who will? The key is facilitating empowerment of individuals at the grassroots level.

## PILOT/PERMANENT SITE

Sandi Schafer, Project Manager, Household Hazardous Waste Management Project, Orange County, CA.

In order to address the problem of HHW in Orange County, the county initiated a three phase project. The first phase, a pilot project, consisted of a series of one day events called toxic roundups. The objectives of the toxic roundups were to:

1. Offer a collection program as a mechanism to divert hazardous waste from municipal landfills, sewers and to prevent illegal dumping.

2. Provide public education to increase public awareness of the:

   - Segregation and disposal of HHW
   - Proper handling of household toxic materials
   - Water quality issue (Long range consequences of improper disposal)

3. Serve as a means of data gathering to:

   - Identify the need and public interest
   - Establish a participant profile
   - Establish "high volume" areas throughout the county
   - Estimate the amount of HHW in the county
   - Estimate the costs of an ongoing collection program

Five toxic roundups were successfully completed. Moving around the county they held one in each supervisorial district. In this way, they could get the Board of Supervisors behind the program. Also, free 'publicity' was provided by local politicians. Each roundup was funded by the Orange County Sanitation Districts and existing landfill monies.

Participants included staff from the various county agencies and departments, city fire and police departments, Orange County Sanitation Districts, solid waste haulers and volunteers from the League of Women Voters. For the pilot project all staffing costs were in kind contributions. They were not included in their costs. Basically, they only had to deal with disposal costs at this time.

Each roundup offered Saturday collection hours. (nine to three) In their publications, flyers, pamphlets, etc., they advised the following safety procedures to limit the liability as far as items coming in at the collection. They were:

- The waste should be in their original containers.
- Containers should be sound and not leaking.
- Contents of the containers should be the same as stated on the label.
- Amount of waste per visit does not exceed five gallons or fifty pounds (the legal transportable quantity).
- Glass containers should be protected from breakage.
- Waste should be segregated from passengers (especially children) in vehicles while transporting.

Although it was announced that we would not accept extremely hazardous or unknowns would not be accepted, some of these materials were brought by residents to the collection sites. In order to properly classify and dispose of unknowns, county environmental health staff made a field determination of the hazard class. All extremely hazardous waste was properly packaged and sent to a class 1 landfill within 96 hours. In California this procedure required an extremely hazardous permit from the Department of Health Services prior to each event, even though it was advertised that "extremely hazardous" would not be accepted.

All other waste was properly packaged and transported by a certified hauler to the county's licensed hazardous waste treatment, storage and disposal facility. The hauler during the pilot phase had applied for a special variance so that he could handle the typical HHW that would be coming in. At the facility they were permitted 30 days to treat the collected waste. The treatment primarily consisted of consolidation and solidification of paint. The solidified paint was disposed of as a hazardous waste and the empty paint containers were air dried, crushed and disposed of at a municipal landfill.

Even if the California Department of Health Services allowed consolidation of paint at the site, the volume received precluded doing so. The state also allowed the county to reuse unopened cans of paint because it was considered "surplus material" and therefore was excluded from the hazardous waste regulations.

The advertising for each event consisted of distribution of approximately 25,000 flyers, 60,000 pamphlets, preparation of over 150 press releases, various presentations, advertisements in the newspaper (two to three weeks prior to the event) and notifications in water bills.

The results of the five completed toxic roundups:

| DATE | LOCATION | SUPV. DISTRICT | NUMBER OF HOUSEHOLDS | # OF 55 GAL. BARRELS OF WASTE COLLECTED |
|---|---|---|---|---|
| APR. 85 | Hunt. Beach | 2 | 702 | 292 |
| JULY 85 | Anaheim | 4 | 902 | 569 |
| NOV. 85 | Laguna Niguel | 5 | 479 | 355 |
| APR. 86 | Santa Ana | 1 | 1,230 | 640 |
| NOV. 86 | Fullerton | 3 | 1,250 | 805 |
| | | TOTALS: | 4,563 | 2,661 |

Note: Paint was not lab-packed

At each roundup, questionnaires were distributed to establish a profile of participants. The results were amazingly consistent and indicated that approximately:

- 50 percent read about the roundup in the newspaper
- Over 50 percent were discarding paint and paint products
- 64 percent would use the service on an average of every six months to two years
- 40 percent would use the service on an average of every six months to one year
- 40 percent are willing to drive between five to ten miles to dispose of the toxics
- 73 percent are willing to pay up to $5 for the services
- 50 percent have a family income between $25,000 to $50,000
- 60 percent of the heads of household are over 50 years old
- 55 percent have a college degree or better
- 91 percent live in single family dwellings which they own
- 64 percent have lived in their home over 10 years

- Over 80 percent of the participants said they were willing to support the location of a household waste collection center in their community.

- Less than 1 percent of the total households in Orange County utilized the free collection program.

The second phase of the project which was recently approved by the Orange County Board of Supervisors consists of identifying semi-permanent collection sites throughout Orange County. Because the most common sources of illegal disposal of hazardous waste at the landfill and in the sewer are from households and very small quantity generators, Phase 2 targets both groups limiting the collection from each generator to the legal transportable quantity of five gallons or fifty pounds per site visit.

As part of the collection project, users must declare householder or small quantity generator status and lists will be prepared as verification so that categorical data can be developed.

Although record volumes of HHW were collected at each roundup, the county will not plan permanent collection stations (Phase 3) until it can be determined if the large volume received is temporarily caused by lack of a proper disposal method. After Phase 2, the county will be able to plan better for permanent collection stations.

To provide an expedient means of collection and disposal, Phase 2 requires that four to five collection sites be established spread throughout the county to target the larger volume areas. Each site will be a joint venture with a city or a combination of cities and appropriate solid waste haulers in the communities. The cities will be requested to assist in identifying and providing applicable collection sites.

Cities and solid waste haulers will be asked to provide staff to work each applicable site to accept, segregate and package waste. The staff will be required to be properly trained in these procedures in a training program set up by the county. The training provided by the county will be developed by the Orange County Fire Department/Hazardous Materials Program, Health Care Agency/Environmental Health and the Hazardous Materials Response Teams serving Orange County. On site supervision will also be provided by county staff.

The county will develop memoranda of understanding with applicable cities and solid waste haulers regarding liability, staffing and reimbursement. There will be no in kind staffing for Phase 2. Four or five collection sites will be run so that there will be a collection program every three weeks. The entire county will be allowed to come to any collection site.

Each collection site will be set up in accordance with Department of Health Services requirements. An approved variance/permit will be obtained for each site. The county will also accept all types of waste and items for recycling such as used oil and batteries, etc. In the RFP, they are going to be aiming at recycling and treatment. For each collection day, licensed hazardous waste hauler/haulers will transport waste for recycling, treatment and disposal to state permitted facilities.

Funding for Phase 2 consists of an additional twelve cents per ton fee at the landfill and a contribution from Orange County Sanitation Districts.

# OVERVIEW OF OTHER MANAGEMENT OPTIONS

## INTRODUCTION

Moderator, Susan Ridgley, Minnesota Pollution Control Agency, St. Paul, MN.

During this conference, the major focus will be on collection programs as the solution to the problem of HHW. However, most of us at some time have asked the question "Is there a better way?" My own theory about HHW is that people, in general, tend to either be "savers", who have a pile of accumulated products stored in their garage, or "throwers", who lack either the storage space or the desire to hang on to their HHW.

Collection projects tend to become convenient services for the "savers" - and only for those savers who are ready to throw and who can make it to the collection site. The "throwers" have already thrown or are not ready to throw.

Collection projects also reinforce the mentality that there is someplace for homeowners to take their HHW and just dump it. This perpetuates the idea of "out of sight, out of mind." There is no sense of management of the waste.

What about after the collection project? Presumably the savers start saving again, while the throwers continue to throw. A recent study[1] (the University of Arizona's project in Marin County) has even concluded that collection projects may turn savers into throwers. Analysis of the waste stream before and after a collection project showed that there was more HHW being discarded in the trash after the collection project than before. The implication is that widespread publicity created a heightened awareness of the dangers of these products - had even labelled them hazardous waste - without providing any ongoing way for the person to responsibly remove that danger.

Finally, anyone who has run a collection project and who wants to continue a program is faced with the issue of costs: staff costs, disposal costs, capital costs. Could we be handling and disposing of these wastes in a more discriminating and less expensive way than the wholesale lab-pack and disposal that we commonly see? Are not some of these wastes better handled through other means? Is there a better way?

The ensuing speakers will be highlighting some new ideas about "better ways" which have been developed around the country. All will readily admit that we are far from developing an ideal solution. They will, however, emphasize a few of the tools which can be used to deal with the disadvantages of collection projects. These tools will probably never eliminate the need for special collection days and pickups however. In general, these alternative management tools tend to fall into the following categories:

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[1] Rathje et al. 1987. A characterization of Household Hazardous Wastes in Marin County, California Association of Bay Area Governemnts, Oakland, CA

1. Waste Reduction/Substitution - The development and use of less toxic or hazardous products, or the reduction of the amount of waste generated through changes in behavior or container size. Our first speaker, Robert Etter, will focus on this option.

2. Recycling - Reprocessing the waste so that a usable product is derived - a technique most commonly utilized with batteries, used motor oil, solvents and sometimes paints.

3. Reuse - For products which the owner no longer wants, for some reason, but which still have inherent value. Most commonly reuse is institutionalized with a "waste exchange". Both Bob Ceru and Diane Christiansen will be talking about the possibilities of reuse and recycling management options.

4. Citizen Waste Treatment - For products which the citizen can take care of at home - for instance, used solvents, latex paint and most cleaning products. Ned Brooks will be describing this option, as well as reuse/recycling, as it can be implemented through telephone advice systems.

# REFORMULATION:
# CHEMICAL SPECIALTY PRODUCT FORMULATIONS MAKE ECOLOGICAL SENSE

Dr. Robert Etter, Vice President, U.S. Consumer Products Research & Development, S.C. Johnson & Son, Inc., Racine, Wisconsin and spokesman for the Chemical Specialties Manufacturers Association.

While some might think that HHW is a "new" issue of the eighties, the household products industry has been involved in this issue for as long as there have been chemical specialties. This is because of the nature of our business.

Through the long process of researching and developing products, carefully testing them in the laboratory and field, submitting them to slow and intensive government scrutiny, and finally bringing them to the marketplace, a very important consideration is integral to each of these steps.

That consideration is the impact of these products on human health and the environment, both during and after their use.

Let me briefly describe the chemical specialties industry. A chemical specialty is chemically formulated product manufactured from basic raw materials or compounds and used by household, institutional and industrial consumers for specific purposes. The product may be a liquid, powder, paste, or tablet. It may be packaged in cans, bottles, cartons, spray-activated containers, bags, or drums.

You use chemical specialties products daily to care for your family, home, pets, furniture, car, and garden. They are in your cabinets and shelves as detergents, disinfectants, deodorants, hair spray, waxes, and polishes roach killers, garden pesticides, automotive products, and many more.

These products are also found in industrial and institutional settings, as detergents to clean food and beverage plant equipment and in automatic car washes, as floor polishes for high-speed machinery to clean and maintain public buildings, as disinfectants used in hospitals.

Chemical specialties products make your life easier, more pleasant, and more sanitary. Today, the business of chemical specialities provides jobs for nearly two million people in the United States.

The management options facing state and local government in disposing of household products are many. They are the focus of this conference. Those options -- proper disposal methods and effective consumer behavior, paint exchanges, telephone hotlines, oil recycling programs -- can be put into effect almost immediately, with the necessary resources.

By contrast, product formulation is a laborious and costly process. It begins in the laboratory where researchers select the basic ingredients of the product. A team of scientists decides if these ingredients are suitable by asking such questions as:

- What are the physical and chemical properties of these ingredients as isolated materials?
- What is the toxicity of the chemicals?
- What levels and types of exposures could result from their intended use?
- Are these substances stable in this combination?
- What is the effect on the environment of these substances?

Since the developmental product seldom meets all the criteria in the early stages, the formula goes through some modification and testing continues. When the scientists are satisfied with the test product, only then is it considered ready for marketing.

Many products aren't fully market-ready until further government review and approval. Products such as pesticides and hospital disinfectants are regulated by several government agencies -- the EPA, the Food and Drug Administration, and perhaps others.

Extensive industry studies of the effect of products on consumer and environmental health, and, in many instances, compliance with strict regulatory requirements give the household products industry the confidence to say that every product on the market performs the task required, is safe when used as directed, and poses minimal threat to human health and the environment when used and disposed of properly.

In some instances, after substantial outlays of time, manpower, and money to bring one product to market, companies begin the process all over again to reformulate a product.

Products may be reformulated for many reasons in response to resource scarcity, for example. A few years ago the oil crisis brought many businesses to a standstill. Lack of petroleum halted the availability of other raw materials, resulting in production delays and austerity measures world-wide and many product reformulations.

However, the primary reason products are reformulated is to meet consumer requirements, including the consumers' needs for safety and positive environmental impact. Consumer changes in lifestyle, population dynamics, new buying trends, need, and other forces stimulate product formulation and improvement.

One example of extensive product reformulation took place in the 1970's. In 1974, the ozone depletion theory brought to light the contention that chloroflurocarbons (CFCs), then a major propellant used in aerosols, were destroying the upper part of the atmosphere or the ozone layer, which shields the earth from harmful ultraviolet radiation. While the international community is only now deliberating this issue, the U.S. government and industry took action in 1978. The EPA and FDA banned CFCs in aerosols as propellants, exempting only slightly more than 1 percent of aerosols for medicinal purposes.

To fill the void left by CFCs, U.S. industry expanded the production of hydrocarbons. Today, hydrocarbons constitute the majority of propellants in the U.S. Hydrocarbon is a liquified gas propellant composed usually of a blend of propane, isobutane, and n-butane. These are naturally-occurring gases, materials that already exist in the earth's atmosphere.

The aerosol industry's retooling, which cost millions perhaps billions of dollars, fostered a search for new propellant blends, leading to the commercial development of dimethyl ether, a highly water-soluble propellant. Companies also found new ways of applying materials already being used to a lesser degree, like the natural gas carbon dioxide, nitrous oxide, and others -- an endeavor that forged inroads into new technology.

Product reformulation has also occurred in the pesticide industry. Agricultural and home and garden pesticides today are a far cry from what they used to be. DDT and other "hard" or persistent pesticides are no longer made. These early formulations left residues that sometimes persisted for years.

By contrast, new formulations are more pest-specific. They don't build up in the environment or concentrate in the food chain. The formulations homeowners buy are also weaker, thus less toxic, than those available to commercial gardeners, pest control operators, or farmers. This means that the percentage of the active ingredient in home-use pesticides is usually significantly lower than that found in professional or commercial applications. As a result, these formulations stay in the environment sometimes for as little as 72 hours. Therefore, they do not constitute a major threat to the environment.

Many consumers may not know that some of the key ingredients of household pesticides are made from naturally-occurring materials. One example is pyrethrin, a compound isolated from chrysanthemum flowers. Pyrethrin acts as an insect-specific nerve toxin which kills many insects very effectively, while not posing a threat to other animals, including man. It is relatively non-toxic except to the pests it is supposed to control, and has a fast degradation curve, so that hardly any trace of it remains.

Changes in formulation are also taking place in the antimicrobial sector of chemical specialties. Antimicrobials are disinfecting agents that kill or inhibit the growth of such microorganisms as bacteria, viruses, mold, yeast, and fungi.

One of the most important uses of antimicrobials is as a preservative in virtually all of today's household products such as dish detergents, fabric softeners, floor waxes, cleaning preparations, paints, and personal care products.

As preservatives, antimicrobials prolong the shelf life of a product and protect the consumer from infection. Some years ago mercury compounds were used as preservatives in many products. Because of the impact of the mercury as a contaminant in the environment the material was abandoned at least 15 years ago. Formaldehyde has been one of the most widely used and effective preservatives. Yet concerns over the health impact on workers and householders of formaldehyde raised the question of its continued use. Exposure to the ingredient was thought to be a cancer risk. As a result of this concern, a number of companies began to seek R&D approaches to non-formaldehyde formulations, and are using these new approaches today.

While reformulation is an industry step taken in response to consumer preferences and advances in technology, it is an extremely expensive one -- to both consumers and industry, and it is by no means the path of choice. There are other options that are key to the subject of this conference which is the disposal of household waste.

When product manufacturers develop household products, the goals are safe and effective use and disposal of those products, to protect both the consumer and the environment. They have been manufactured, packaged and tested for home use and safe disposal through normal waste collection systems.

Some household materials (such as old pesticides, batteries, photo hobby materials, used motor oil, gasoline and ammunition) may pose disposal problems, but the key to safe and proper disposal is education. This is one of the most effective tools available on this or any issue.

One of the most effective information resources active today is the Household Products Disposal Council (HPCD). Established by the consumer products industry, this information bureau, now one year old, is dedicated to educate consumers and communities in proper disposal.

It has been effective in providing disposal assistance to local collection day organizers, consumer groups, government agencies, waste professionals, educators, and many individuals.

Clearly, education is an important tool on this issue.

I'm glad to have had the opportunity to meet with you. Industry has as a highest priority the protection of consumer health and safety and the environment. We welcome your ideas and look forward to working with you in the future. Cooperatively, and collectively, we can make a real and lasting impact.

# REUSE RECYCLING AND A HOUSEHOLD HAZARDOUS WASTE APPOINTMENT SYSTEM

Robert Ceru, Supervisor, Toxic Materials and Hazardous Waste, Ingham County Health Department, Lansing, MI

## HHW APPOINTMENT SYSTEM

In 1986 the Ingham County Health Department began an ongoing HHW program. In order to make it a safer program it was decided to make it an "appointment only" program. To bring materials into their facility an appointment must be scheduled. An appointment form is filled out listing name, address, phone number and information about the types and amounts of waste to be brought in. In this way, when they are going to receive materials such as parathion or sodium arsenate, they know in advance what they are going to do with them. This is one of the advantages of an appointment system.

Approximately one week before an appointment, the homeowner is sent a reminder card (a simple three by five postcard). It provides directions, and the time of the appointment. Although most collections are on Wednesday, during the day, some collections are scheduled on Saturday for those people who cannot come during working hours.

## ADVANTAGES OF THE APPOINTMENT SYSTEM:

1. Easier pre-planning to have in place:
    a) supplies and equipment needed
    b) number of staff required
    c) special safety precautions
2. Number of participants can be controlled*
    a) constant and manageable schedule
    * In 1986 they had $10,000 from the County. In 1987, they are operating under an EPA grant of $30,000. With a limited budget, they need to control the number of people coming in.
3. Allows for person-to-person education
    a) The types of wastes as well as what can be done to reduce them can be discussed.
4. Provides for clarity of what types of materials are accepted.
5. Reduces possible accidents or mishandling of materials
    a) Labels
    b) Containers

Ceru did not go into depth regarding their safety precautions or the ongoing monitoring of employees working at the site, however those are other components of their program.

## LOGISTICS OF AN EVENT

There is a paramedic on site while HHW is being handled. He also supervises traffic control. A garage is utilized for the collection event. The person who greets the homeowner gives him/her a questionnaire and a packet of information. Two cars can be handled at once. Three to four people can be handled every 15 minutes. They have had experience with a collection where they handled one person every minute. It involved a staff of 35 people. The current arrangement is much easier to manage.

Because of the pre-drop-off telephone contact they are able to tell people that materials should be brought in a cardboard box for easier, safer handling. They use Health Department staff and also volunteers from the County's Department of Natural Resources. Materials are separated, but not stored. One of the stipulations in setting up the program was that the waste would not be stored at the facility. They utilize a hauler who has a TSD facility.

All liquids that are in glass are packaged in DOT-approved "flammable liquid" boxes. All materials in metal containers that are combustible or flammable are put into metal drums. Aerosols are put into boxes. They ask homeowners to bring solid pesticides in opened containers wrapped in sealed clear plastic bags. In the case of unknowns their system enables them to ask the homeowner what the unlabelled waste is. Many times the citizen is able to provide the answer.

Extremely hazardous wastes are especially important to know about in advance. For example, they received sodium cyanide (16,000-20,000 parts per million). It belonged to a family who had been using it to plate jewelry as a hobby. Because of the telephone system in cases like this they can go out to people's homes and advise them about how to package and deal with their hazardous wastes. Waste gasoline is not an item they like to accept. Through the telephone system they can put citizens in touch with others in the community (farmers burning brush who can use waste gasoline, etc.) who can use the materials that the homeowner wishes to dispose of. They can also suggest ways the homeowner can reuse or recycle the material. In the case of waste gasoline, if they do accept it, it must come in in an approved gasoline container.

On a collection day, the hauler comes at noon and takes away the packaged materials.

Costs:
1986

| | |
|---|---|
| Collection Days | 5 |
| Total Households | 139 |
| Average Households | 28 |
| Disposal Cost | $10,065.75 |
| Average Disposal Cost | $ 2,013.15 |
| Cost/Household | $ 72.42 |

With an average cost per household of $72.42 they realized that in order to continue the program costs would have to be reduced. As a consequence, a recycling program was initiated. They do not take waste oil. A local store has a 1,000 gallon tank in front of it where people can dispose of waste oil. Batteries can also be brought to different stores. Anti-freeze can be poured down the drain. (They checked with their wastewater treatment plant before recommending this to homeowners.) There are other materials that can safely go into the sewer, and do not need to be brought in to a collection event.

It is not feasible to recycle to individuals, such as housepainters, however an auto club, which has two or three major meets each year, will take all the automotive supplies that come in. Usable materials are set aside as they are logged in. Those wanting the recycled materials come in at noon and pick up the materials. Theatre groups are taking a lot of materials. The Michigan State University Housing Cooperative is one of the program's best outlets. With 12 homes each having from 20-30 rooms, they take not only paints, but items such as drain cleaners as well. Pesticides are recycled on a limited basis. Chlordane and lindane are not recycled, however malathion is. Some garden clubs have taken the materials. As a result of the recycling costs have been brought down.

1987 (March-September)

| | |
|---|---|
| Collection Days | 7 |
| Total Households | 204 |
| Average Households | 29 |
| Disposal Cost | $9,363.00 |
| Average Disposal | $1,337.57 |
| Cost/Household | $ 45.90 |
| Recycling Savings | $8,213.25 |
| Average Savings | $1,368.88 |

Recycling is not easy. For example, many people forget they are supposed to come pick up materials. Nevertheless, recycling has been a major factor is Ingham County's ability to continue their HHW collection efforts, in spite of a limited budget and lack of storage space.

# PAINT EXCHANGE PROGRAMS

Diane Christensen, Environmental Specialist, Department of Environmental Health Services, San Bernardino County, CA,.

Christensen coordinated the HHW for the County.

## INTRODUCTION

Of all the wastes collected during any HHW collection probably the largest quantity of waste will be paint or paint-related products. The estimated percentage of paint in this particular waste stream ranges from 60-80 percent of all wastes collected.

This large percentage demonstrates the need for cost effective disposal, however, paint is a waste that lends itself readily to simple reuse and recycling. Paint exchange programs connect discarded but usable paint to individuals, organizations, and agencies in need of paint. A paint exchange program can involve three different avenues:

- o the redistribution of usable paint
- o usable paint referral program
- o reprocessed paint distribution

## USABLE PAINT REDISTRIBUTION

Santa Monica, CA, was the first to offer usable paint redistribution. They advertise that usable paint only in full or almost full containers would be collected and that thinners, stains or other household waste would not be accepted. The public, community groups, churches, and schools are invited and encouraged to take paint they can use for free. What latex paint is left is bulked into 55 gallon drums, at a local paint manufacturer, a major paint company reprocessed and donated it to a graffiti-removal program conducted by neighborhood groups. A letter writing campaign, targeting local organizations, theater groups, schools, and churches is very successful in finding reuse for some of the remaining paint. Their paint exchange program helped them identify a real need for collection of other types of HHW while helping to solve the problem of unwanted paints going into sanitary landfills.

In MN, the State Pollution Control Agency devised two systems to safely yet inexpensively dispose of waste paint. First, community collections were organized where paints were sorted by trained volunteers and agency staff into one of three categories:

1) "Non-hazardous" - already dried out paint which was put in a dumpster for transport to a sanitary landfill.

2) "Good paint" - usable paint in a container in good condition holding 1/3 gallon or more, or for latex paint which had never been frozen.

3) "Bad latex" or "bad oil" - non-usable which was separated and bulked into 55-gallon drums and sent to a hazardous waste incinerator.

In each collection project held in the state, local organizers were encouraged to locate outlets for the usable paint. This paint was picked up at the end of the day by these outlets, usually community service organizations. In one case a fire restoration contractor took it and used it as an odor sealer on burned timbers. Through this organized redistribution about 500-600 gallons of paint from 2,100 participants were recycled.

## USABLE PAINT REFERRAL PROGRAM

Citizens in Minnesota without access to a collection center were provided with contacts who would be able to use their paint. This is the second option-a usable paint referral program. A usable paint referral program involves not accepting the paint at all. Rather, a telephone number for a products exchange coordinator would be publicized to area residents. As with the redistribution program, the coordinator would develop a list of organizations who could use the paint. When someone called wanting to get rid of usable paint, the coordinator would give the person the list of telephone numbers of organizations willing to accept it. This service could even be expanded to include other usable HHW as was demonstrated earlier.

## REPROCESSED PAINT DISTRIBUTION

The third program, reprocessed paint distribution, is a two-fold one. First, it involves collecting usable paint from the public, separating and bulking it by type, and reprocessing it into a consistent color and quality for use. Second, the paint must be distributed to be used.

In San Bernardino County, CA, waste paint collection is an on-going process. The county operates five permanent collection sites, and one treatment, storage, and disposal (TSD) site. All paints are brought to the TSD to be bulked according to water-base or oil-base classification. The bulked oil-base paint is held in 55-gallon drums sorted at the TSD collection center until a contracted paint hauling company pumps out these drums. The drums are currently pumped out every 60 days and the waste oil-base paint goes to a solvent recovery plant. After all solvents have been recovered, the waste sludge is incinerated.

If this paint were remanufactured, its application would not be permitted in this county or probably anywhere in southern CA due to its high solvent content and certain air pollution control restrictions. However, in San Francisco and Morgan Hill, CA, oil-base paints are bulked and reused to paint some portions of buildings and for the Parks and Recreation Department's use in painting fences, benches, etc. In some cases oil-base paint can actually be recycled.

The latex paint, after consolidation of small containers into 55 gallon drums, is submitted to a local paint manufacturer where the paint is used in the production of an industrial grade primer. This primer, which is beige in color, is packaged in plastic five gallon buckets ready for use. Finding agencies in San Bernardino county interested in using this paint has been both challenging and rewarding. One interested county agency, a minimum security correctional facility, remarked that using this paint would save them approximately ten dollars per gallon on paint cost. They were also able to save on labor costs by using the inmates to apply the paint. Another county agency willing to try the recycled paint was Facilities Management. This department oversees the Senior Housing Repair Program which is a federally funded grant program for needy senior citizens. By using the paint donated by the San Bernardino County Department of Environmental Health Services, they are able to offer more services for their seniors. The grant monies can be stretched to include more services per grant recipient.

There are many ways in which paint can be reused or recycled, so that disposal as well as environmental costs can be reduced. The success of any paint exchange program depends on the resourcefulness, imagination, and abilities of its organization to find alternative uses for unwanted paint.

## TELEPHONE HOTLINES OR TELEPHONE ADVICE SYSTEMS

Ned Brooks, Pollution Control Specialist, Minnesota Pollution Control Agency, St. Paul, MN

It is likely that all of us here have received calls from citizens requesting disposal information for HHW. Have you ever stopped to think that the perhaps realization of the need for HHW management programs has grown out of people getting these phone calls?

Independently and sometimes inconsistently, people all round the country have been receiving calls and developing answers to these disposal questions. At some point the notion of having collections to gather these wastes emerged and over time the HHW collection day has become our primary management tool.

However, we have come to recognize some problems with relying on collections alone. MN recently completed its Telephone Advice Guidance Manual which provides a formal way to respond to citizens' disposal questions. I would like to suggest that a formalized telephone advice system enables citizens to have access to knowledgeable information sources for HHW management on an on-going basis by making a simple phone call. Around the country, a number of different telephone advice systems have emerged. Most systems share the following three functions:

1) Identify which products are reusable or recyclable and identify outlets for these products.

2) Identify which products can be safely treated and handled at home through existing disposal systems, e.g., sewer or trash

3) Act as referral for collection services.

One successful and fairly common approach has been the establishment of a centralized number to receive HHW disposal questions. It is promoted as a referral for government agencies and landfill operators, among others. Such central "hotlines" have also been publicized to varying degrees through paid advertising and the distribution of press releases, flyers, and public services announcements. One example of a centralized telephone system is the "Hazard Line" in Seattle, WA. This well-publicized hotline receives about 20 calls per day. FL, CA, and MN and WA also have centralized statewide toll-free "hotlines." Other areas such as MI and OH have localized hotlines. There are probably others not included on this list.

The key to these systems lies in the development of an information base, usually in the form of a manual of recommendations which provides disposal options for a local area. MN has recently completed its own telephone advice guidance manual. This manual, which was contributed to and reviewed by numerous individuals and organizations, compiles the information necessary to give advice on appropriate HHW disposal. In the absence of specific laws or guidelines to regulate HHW disposal, the advice contained in the manual reflects the available information and the opinions of those who had input into the manual.

The manual contains background information and disposal advice for a variety of commonly encountered wastes. It is in a looseleaf three-ring binder so it is easily added to and adapted for use on a local level. For each waste, a short section describing the waste's hazardous properties, use precautions, problems of improper disposal, and other background information is followed by a flow chart that helps identify the appropriate disposal options.

An example is Exhibit 7 which is a flow chart for non-chlorinated solvents; items such as paint thinners and other flammable solvents.

These flow charts are the focus of MN's advice manual. The flow chart asks a series of questions relating to waste quantity, condition, and other information. Based on the answers to these questions, the flow chart will identify at least one disposal option.

The specific disposal instructions are not given on the flow chart but are listed on a separate page later in the manual. This makes it possible to list all of the necessary precautions and outline the disposal advice in a detailed manner on a single page.

The suggested disposal advice follows this hierarchy:

1) If possible, reuse or recycle the waste.

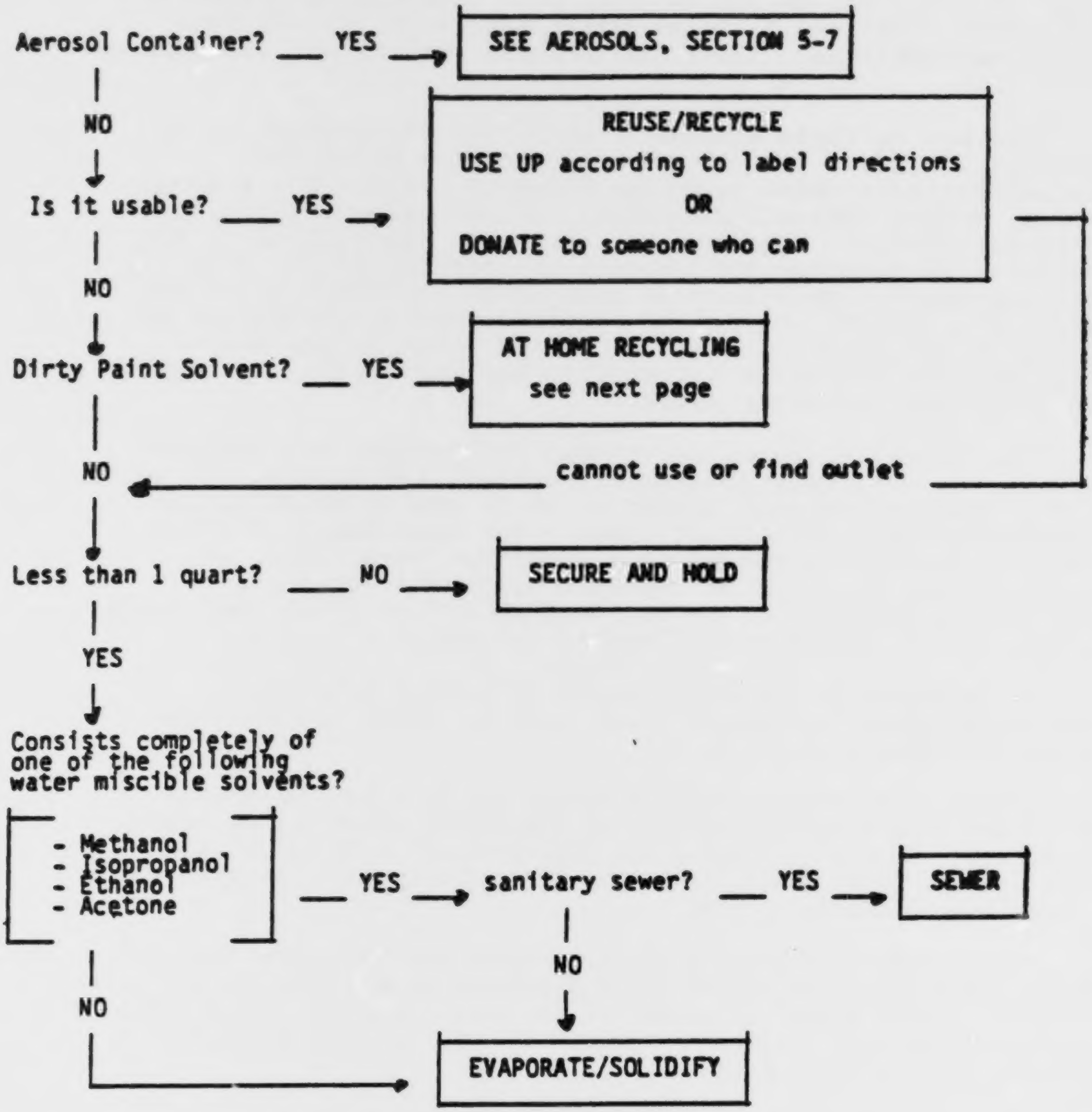
2) If possible, safely treat and/or dispose of the waste at home.

3) If available, utilize disposal service.

4) In the event that no disposal alternatives exist, the caller is instructed to safely store the waste until a disposal alternative becomes available.

Exhibit 7

## 2-3b Non-Chlorinated Solvents


Aerosol Container? ___ YES
SEE AEROSOLS, SECTION 5-7
NO
Is it usable? ___ YES
REUSE/RECYCLE
USE UP according to label directions
OR
DONATE to someone who can
NO
Dirty Paint Solvent? ___ YES
AT HOME RECYCLING
see next page
NO
cannot use or find outlet
Less than 1 quart? ___ NO
SECURE AND HOLD
YES
Consists completely of one of the following water miscible solvents?
- Methanol
- Isopropanol
- Ethanol
- Acetone
___ YES
sanitary sewer? ___ YES
SEWER
NO
NO
EVAPORATE/SOLIDIFY

If human or veterinary exposure has occurred refer to Poison Control Center for immediate care instructions:

| | |
|---|---|
| West Metro | 612-347-3141 |
| East Metro | 612-221-2113 |
| Greater Minnesota | 1-800-222-1222 |

Sample of Flow Chart

Source: Minnesota Pollution Control Agency

Where most advice systems have developed an information base to respond to calls, the one used in MN is different in a number of areas. The differences are as follows:

1) The flow chart system and the detailed disposal advice enables this manual to be used by an individual who has had little technical training. Because the flow charts essentially make the disposal decisions, little or no judgment is needed by the person handling the call. The advice is fairly conservative and safeguards are built into the flow charts. For example, if the answer on quantity is "more than one quart" the caller will be told to hang on to the waste until there is a collection program. Users are, however, required to attend a training session that emphasizes how to use the manual properly.

2) Although most systems keep track of the number of calls MN keeps track of the waste name and quantity, the advice given, and the caller's zip code. See Exhibit 7A. This enables them to computerize and tally the information and use it in evaluating and planning the program. This also enables them to follow up on calls for which the advice was save for collection or other disposal. Finally the form filled out serves as a record of the call in the event a problem arises.

3) Perhaps the most unique aspect of the advice system in Minnesota is that it is a decentralized network. Not only do they maintain a central disposal hotline with an 800 number but they have also emphasized local hotlines. The advice manual is fairly generic and requires significant input at the local level. This input is especially important in the area of identifying reuse and recycling outlets. Currently, in MN, 16 organizations including county zoning, solid & hazardous waste offices, health departments, a sewage treatment commission and several state offices provide local hotlines in areas throughout the state. There has not been promotion for the hotline as yet. Referrals and inquisitive people who make the effort to find out what to do with their wastes are the sources of callers.

Telephone advice systems can prove to have a number of disadvantages:

1) The average person must be sufficiently concerned about proper disposal to carry out the advice.

2) It is impossible to know whether or not the caller followed the disposal advice and therefore it is difficult to monitor effectiveness.

Exhibit 7A

## HOUSEHOLD HAZARDOUS WASTE CALL RECORD

MUST COMPLETE:

Date ____/____/____ Your Initials ____________

Caller's Zip Code ____________ Your Agency ____________

Caller's Name ____________ Caller's Phone (   ) ____________

Caller's Address ____________
Street City
(Name/Address/Phone only necessary if follow up required)

**WASTE #1**

PA ☐ Paint, Varnish, Stain, etc.
GS ☐ Gasoline, Other Fuel Name ______
SO ☐ Solvent Name ____________
AD ☐ Acid Name ____________
PE ☐ Pesticide Name ____________
OL ☐ Motor Oil
OT ☐ Other Name ____________

Quantity: ____________ qts.
or
____________ lbs.
or
____________ items

**Advice:**

SH ☐ Secure and Hold
RC ☐ Reuse/Recycle List outlet below
SW ☐ Sewer/Land Spread
WT ☐ Wrap and Trash
EV ☐ Evaporate/Solidify
MO ☐ Mix with Oil
OR ☐ Other (describe below)

Details and Explanations: ____________

**WASTE #2**

PA ☐ Paint, Varnish, Stain, etc.
GS ☐ Gasoline, Other Fuel Name ______
SO ☐ Solvent Name ____________
AD ☐ Acid Name ____________
PE ☐ Pesticide Name ____________
OL ☐ Motor Oil
OT ☐ Other Name ____________

Quantity: ____________ qts.
or
____________ lbs.
or
____________ items

**Advice:**

SH ☐ Secure and Hold
RC ☐ Reuse/Recycle List outlet below
SW ☐ Sewer/Land Spread
WT ☐ Wrap and Trash
EV ☐ Evaporate/Solidify
MO ☐ Mix with Oil
OR ☐ Other (describe below)

Details and Explanations: ____________

[✓ Follow Up?] Yes ☒ No ☐

What Kind?
P ☒ Call when program established.
R ☐ Need recycle outlet
F ☐ Send fact sheets, other info: ____________

____________ Date Sent: ______

Please send copy to MPCA Central Office
520 Lafayette Road
St. Paul, Minnesota 55155

Source: Minnesota Pollution Control Agency

3) It is labor intensive, and requires a staff person to be available to answer incoming calls.

4) Telephone advice systems must be supplemented by collection and disposal services.

A telephone advice system has a number of clear advantages:

1) It is available to all home owners on an ongoing basis.

2) It decreases the amount of material requiring collection and costly disposal by offering alternatives such as reuse, recycling, and home disposal by phone and therefore the price of collection activities is kept down.

3) Disposal advice in many cases needs to be specifically adapted to accommodate unusual circumstances. By maintaining one-on-one citizen contacts, it is possible to give advice and feel out the caller to ensure that they understand the information.

4) Formalized telephone advice system minimizes liability by providing an organized well-thought out advice system, and a well-documented record of advice given. It is improvement on the hit-or-miss approach being taken in many places.

The telephone advice system is an important part of any HHW management program.

## CONCLUDING REMARKS

Susan Ridgley, Moderator

Before we get into the question period I would like to briefly mention some of the advantages and disadvantages of these non-collection management options. (To give credit where credit is due, I am plagiarizing here from Jennie Goldberg's new report Household Hazardous Waste Management: A Survey of Selected Programs in North America and Europe, January 1987, Water Quality Division, Municipality of Metro Seattle, WA.)

First, the disadvantages:

- Relies on individual to make behavior change - you need to be an optimist!
- Requires continuous education programs
- May require establishing new laws
- Requires extensive cooperation from other elements in the community, including private business.
- Does not eliminate the need for collection projects for highly toxic or difficult-to-manage waste.

Now, the good news! The advantages are:

- Addresses the possibilities of waste reduction
- Puts responsibility in hands of consumer (may even convert some throwers into savers)
- Reduces the reliance on hazardous waste disposal facilities, which are already in short supply.
- Reduces costs (that is a big advantage!)
- Recycles usable material, appealing to the Yankee thrift in all of us
- Provides an element of long-term management for the entire community.

# OVERVIEW OF SPECIAL WASTES

## BATTERIES

Judy Orttung, Technical Consultant, San Bernardino County Health Department, San Bernardino, California.

Orttung explained that the special wastes listed in the program (waste oil, paints, pesticides) were designated as such in part because of the volume of these wastes encountered in collection programs and in part because of the kind of handling methods these wastes require.

Disclaiming any status as an expert on batteries Orttung presented the information that she was able to find on the subject. Her sources were background reading and a telephone interview with Allen Hershkowitz of INFORM, on hazardous waste issues and how they are being handled in Europe and Japan.

### PROGRAMS IN JAPAN AND SWEDEN

In Japan there are two separate programs for the collection of batteries. Cylinder-type batteries, small dry cell batteries which are manganese and alkaline manganese,are now being collected by 73 percent of the municipalities (3,255 municipalities), covering 72 percent of the population. The button-shaped batteries are being collected by the manufacturers themselves. Both of these are "voluntary" programs. The Ministry of Health has requested these programs, but they are not mandatory. The button batteries are being collected in retail stores. One hundred percent of the population is covered. At the present time the Ministry of Health is only targeting mercury batteries for recycling. Because there is no way of distinguishing mercury batteries from other batteries all batteries are being collected. Also, there is some mercury in the dry cell batteries. For the present, the Japanese government, using World Health Organization data, claims that there is no health hazard from mercury emissions from municipal incinerators. It is because the populace itself is concerned about these problems that the Ministry of Health has requested these collection programs.

The program in Sweden is based on a study sponsored by the Swedish Department of Environment. The study claims to have detected health effects from mercury emissions. They wish to reduce as much as possible all the mercury in the environment. For this reason the Swedes have a battery collection program.

It began in 1983 as a voluntary program in those cities which had municipal incinerators. There are no deposits or subsidies on these batteries. Public information and the convenience of the collection program are what they count on for the success of the effort.

In Japan for 1986 they collected 9 percent of the cylinder batteries sold, and 27 percent of the button batteries. Figures were not available for the kind of response in Sweden. The Swedish program is a mandatory one. Posters are everywhere informing the public of the importance of returning batteries to collection centers. Mercury batteries are being recycled and and the mercury is being recovered. The remaining batteries, both in Sweden and Japan, are simply being stored, because there are no known ways of recovering the materials from them.

## UNITED STATES

In the US there are voluntary programs in New Hampshire and Vermont. Volunteers have put boxes in retail outlets and are collecting and sorting the batteries. Mercury and silver oxide batteries are recycled.

New York State is currently considering legislation that would mandate a recovery program.

Also of concern are lead-acid batteries. A June, 1986 study done for the EPA by a private consulting firm in Massachusetts showed that in 1980, 87 percent of all lead-acid batteries were recycled. By 1985, the percent had dropped to 59 percent. This means that 120,000 to 180,000 tons of lead were getting out of the system. Anecdotal evidence indicates that these unrecycled batteries are not being handled properly. Instead of going to a hazardous waste landfill they are ending up in municipal landfills. Two reasons are cited for this. Industry claims that there are increasingly stringent regulations on lead-acid batteries. The other very important factor is the pricing of lead in the secondary lead market. Based on the findings of the study the consulting firm made some recommendations to the EPA regarding the need for a regulatory program to deal with the problem and a possible deposit system to encourage recycling. Since 1986, there has been an increase in the price of lead in the secondary market, and therefore there is a higher rate of recycling of lead-acid batteries.

# WASTE OIL

Mr. Donald Gilson, Senior Environmental Specialist, Chevron USA, San Francisco, CA.

The title of this presentation in the preliminary program for the conference is shown as "Waste Oil." I have taken the liberty to change the title to "Used Oil." The term "waste oil" implies that oil becomes a waste material when it no longer has the properties that originally made it useful. One purpose of the presentation is to highlight some of the uses of "used oil" and show that it need not be discarded after use.

Technically, waste oil consists of both used and unused oil. It becomes adulterated when it is used unfit for service and as a result of this contamination it needs to be taken care of either through recycling or through disposal.

There are many sources of used oil. Information gathered by EPA in 1983 indicates that approximately 1.2 billion gallons of used oil are generated annually. Of this total, 700 million gallons come from lubricants such as engine, gear and turbine oils. About 500 million gallons come from industrial uses such as hydraulic fluid, metal working fluids, insulating oils and coolants. This part of the used oil universe is fairly well controlled because it is in the industrial segment. Of the 700 million gallons roughly half of it is from the do-it-yourself (DIY) oil changers who change the oil in their automobiles.

The handling of used oil is broken down as follows:

| | |
|---|---|
| - Reprocessed for burning<br>(Oil is collected through simple filtration water is removed and then mixed with virgin oil depending on the level of contaminants) | 49 percent |
| - Re-refined<br>(Oil is collected and goes through a chemical processing procedure, probably vacuum distillation, or acid treatment, another filtration, additives are put in and then it is sold as 'new' product.) | 5 percent |
| - Road Oiling<br>(This is no longer an acceptable method) | 6 percent |
| - Non-fuel<br>(Base stock for asphalt) | 3 percent |
| - On-site recycling<br>(Waste oil burners for heating) | 4 percent |
| - Dumping<br>(Soil, sewers, landfill, trash) | 33 percent |

DIYers account for approximately half of the dumping of used oil. Favorite locations are the backyard, the drain in the basement or putting it in the trash. Since trash is compacted the oil does not stay put even in closed containers.

## REGULATORY HISTORY

To respond to mismanagement of used.oils, Congress passed the Used Oil Recycling Act in 1980. The Act directed EPA to study what happens to used oil and what can be done to manage it.

In November 1985, EPA published a two part proposal in the Federal Register that would list used oil as a hazardous waste and establish special standards for used oil recycling. These proposals prompted more than 850 comments from potentially affected parties who were concerned with the "stigma" associated with a hazardous waste listing on used oil. Commenters were concerned with increased costs associated with handling hazardous waste and potential Superfund liabilities. Increased costs along with a potential reduction in the number of locations accepting used oil could lead to more uncontrolled disposal of used oil.

Finally, in November 1986, EPA issued the used oil rule. Recycled oil was not listed as a hazardous waste, but disposed oil must be handled as a hazardous waste. The announcement also mentioned that recycling and disposal standards were still to come.

Another rule, which took effect in May 1986, specified that used oil mixtures containing 1000 parts per million of total halogens are subject to the full hazardous waste regulations. This rule prohibits the introduction of chlorinated solvents into used oil.

Six states have passed regulations that list used oil as a hazardous waste or require that it be managed as such. Regulations passed by some states and municipalities put special restrictions on the collection, storage, transportation and treatment of used oil.

## CONCERNS

Economics - The fall in crude oil prices in November 1985 has had a profound effect on the used oil market. Service station owners who formerly received $.02 to $.018 per gallon for used oil must now pay for collectors to pick it up. Much of the collected used oil competes with virgin oil as a boiler fuel and reprocessors must charge in order remain competitive.

Operating used oil storage tanks is becoming increasingly difficult and expensive. Recent underground storage tank regulations require increased monitoring and inventory controls. Cleanup of a spill or tank leak can be extremely expensive.

Service station issues - The cost to dispose of used oil has forced dealers to charge customers for taking it. A service that was once free, now costs about 25 to 50 cents per gallon. Dealers are also reluctant to accept oil from the general public because of the chance that the oil may be contaminated with chlorinated solvents or other hazardous wastes.

Community Programs - The best used oil collection programs have been voluntary public awareness campaigns based on education and cooperation. Used oil programs with unenforceable management and recycling requirements have not been successful.

# RECYCLING OIL

Douglas Kenyon, Browning Ferris Industries, San Jose, CA

Kenyon's firm, Browning Ferris Industries (BFI), is not in the oil recycling business. Their principal involvement is with solid waste, collecting and disposing of garbage. Anyone who has ever had the experience of riding along in a refuse collection vehicle knows what happens when fluids are compacted. They fly everywhere. In this regard oil is one of the worst fluids. The oil from a compacted container covers the collection vehicle, the workers, and/or the customers' automobiles or other property.

BFI addressed a three-fold problem:

1) Oils were commingled with residential trash, thereby contaminating the waste that was going to the sanitary landfill.

2) Their customers were the cause of oil spills and sprays on people's cars, BFI's property and the city streets. The average cost of a clean-up when a steam cleaner had to be sent to a neighborhood was $68 per incident. If three or four of these clean-ups had to be done in a day it became quite expensive. Ultimately, that expense was borne by the community.

   Not many alternatives could be offered to people. The main advice offered was to take the oil to a local service station. Most people tend not to want to bother taking used motor oil (usually in a bleach bottle) to the service station. Instead they put it in the bottom of the garbage can, put it out for collection and it's "out of sight, out of mind."

3) The third aspect of the problem was the safety hazard to the refuse collection workers. Oil would get in their eyes. Ruined uniforms and loss of productivity were additional factors that lead to the conclusion, from a garbage collection perspective, that the problem needed to be addressed.

## CURBSIDE COLLECTION

In the California community of Milpitas BFI added something to the RFP for residential contracts which was not asked for by the community. BFI said that they would provide a curbside residential collection program for used motor oil. They would use the refuse collection vehicles, specifically designed with holding tanks, provide containers for the use of residents or accept the residents containers, along with their regular pick-up at curb-side. BFI did not expect that this would get widespread use. They projected a 1 percent participation rate. Basic facts about Milpitas were: 12,000 residential households; five routes, five days per week, one man side loader vehicle.

The town accepted BFI's proposal. The refuse collection vehicles were fitted with holding tanks on their undercarriages. Originally, the tanks were ten gallon capacity with a discharge valve that could be used at the BFI yard. The residential waste oil could then be commingled with the company's own waste oil which was routinely pumped and sent to an oil recycler.

Within the first months of the program BFI was inundated. The 10 gallon holding tanks were not large enough. The tanks were increased to 20 gallons. On some routes they needed to have a 30 gallon capacity. Field supervisors had to go around with jerry cans to help facilitate collection of the oil. Although the response was greater than they originally expected they were glad to know that these materials were not getting into the waste stream.

With this new system, the drivers monitor compliance. They notice if some residents are still using the practice of hiding oil in the trash. They send a letter, carbon-copied to the City Fire Department, reminding the individual that the used oil collection program is in effect. Residents utilize a regular gallon milk carton available at BFI's offices or at the district fire departments, or they still may use empty bleach bottles. The important aspect is that they are taking advantage of the program.

## PAINTS

Robert J. Nelson, Associate Director for Environmental Affairs, National Paint and Coatings Association, Washington, DC.

Since paint wastes represent a major portion of the wastes collected during HHW collection programs and much attention has been focused on them. These discussions have also centered on the feasibility of recycling these wastes back into new consumer paint products. Recycling has proven to be a valuable waste management practice for many industrial and consumer wastes, i.e., recycling of spent solvents, used oil, aluminum cans. In theory, the recycling of consumer paint products by paint manufacturers would help solve the disposal problem operators of collection programs face and could help to minimize the landfill capacity problem. While these are laudable goals, we must be aware of the obstacles that such an undertaking faces. First, we need to get an idea of what paint products homeowners are using and thus disposing.

Presently the United States consumes about one billion gallons of paint and coating products per year. This figure is for all types of paint and coating. Of the one billion gallons 46.5 percent (46,500,000 gallons) are architectural coatings. Architectural coatings are coatings that are formulated for use on new and existing residential, commercial, institutional and industrial, structures. Architectural coatings can be broadly classified as interior and exterior paints both of which include waterborne latex materials and solvent based formulation. Of the 465 million gallons of architectural coatings used every year, 60 percent (280 million gallons) are used in residential painting; 185 million gallons are used by do-it-yourselfers, and the other 95 million gallons are used by professional painters or contractors. Homeowners also use a variety of other specialty coatings including aerosols, roof coating, arts and crafts and other specialty coatings. Homeowners consume around 16 million gallons of these special purpose products per year. It is the architectural coating component that Nelson's discussion centered on, since as he explained, they make up the majority of the paint products used by consumers.

Architectural coatings which are used to preserve and decorate your home and surroundings are manufactured in both water based (latex) and solvent based formulations. Currently the market breakdown is that: 73 percent is water based, 27 percent is solvent based. The percentage of water based is even higher in CA because of the strict air pollution regulations. (VOC regulations) The water based portion is probably 80-85 percent in CA.

The disposal of water based paint waste and solvent based paint waste present different problems for collection program personnel. Solvent based paint wastes are ignitable. When collected and consolidated in large amounts these household wastes must be managed as hazardous wastes. But because of their ignitability it makes them more amenable to disposal. These wastes can be incinerated or used in secondary fuels programs. This is not the case for water based paint wastes. Water based paint waste are one of the largest single volume wastes collected at HHW collection programs. Even though latex paints are not considered hazardous waste under federal or most state RCRA rules, that does not alleviate the problem for collection program personnel of handling and disposing of these materials. The management of large amounts of non-hazardous liquid wastes is very expensive. It can't be burned except in a large-scale rotary incinerator. To incinerate it is an expensive adventure. Neither can it just be dumped anywhere. This is why the idea of recycling consumer water based paint waste back into new paint products has been discussed and promoted so widely as a viable management alternative. Unfortunately, this alternative faces a variety of technical, regulatory and economic obstacles that are not present in the traditional recycling situation (i.e., newspapers, used oil, aluminum cans). In the traditional recycling situation, you are dealing with a basic raw material. You have a known and proven recovery technology and there is definite market for the recycled material.

When it comes to recycling consolidated consumer paint waste, these elements are not present. It is not a basic raw material. There is not a basic reprocessing technology. There is not a basic or definite market available. This raises several quesitions when talking about recycling consumer paint wastes.

First of all, what is paint? Paint is a complex chemical mixture of resins, solvents, pigments and additives. These various products come in hundreds of formulations - formulated for specific applications, and are a result of a lot of research to be sure consumers get a product that meets their needs. The paint has been formulated to meet a set of special properties. Nelson stressed that this is a very important point that must be kept in mind throughout any discussion of recycling paints.

## TECHNICAL CONCERNS

What are the technical, regulatory and economic obstacles that make consumer paint waste recycling so different from other more traditional consumer recycling efforts? First the technical concerns. Consumer paint wastes are not a reliable source of raw material. Today consumer paint products are based on well-researched formulations designed to provide quality performance, i.e., exterior durability, washability, gloss, color retention, adhesion, etc. In order to consistently get the desired performance properties, manufacturers must use raw materials of known quality.

The use of raw materials of questionable or unknown quality will compromise the performance of a paint product and can only result in the manufacture of an inferior or lower quality product that is unacceptable in today's market place. Experience has shown that people tend to dump foreign materials into open or partially used paint cans before turning them into a collection program. Once the opened or partially used products have been contaminated with a foreign or toxic materials, such as used motor oil, pesticides, or other household liquid wastes, the waste is unfit for recycling. Collection site personnel also tend to mix solvent based paint waste with water based paint waste. This also makes the waste unfit for recycling. A paint can makes a good trash can. There is simply no guarantee that the consolidated consumer paint wastes from the collection programs have not been contaminated with foreign or toxic materials. In addition, the paint manufacturer is faced with the problem that no two drums of consolidated paint waste are the same in composition. The two problems, toxic contamination and inconsistent composition, make consumer paint waste an unreliable source of raw materials for paint manufacturers.

Consumer paint waste offers only limited opportunities for recycling. The formulations that these materials can go into are very limited in nature. The characteristics resulting are very limited.

## REGULATORY CONERNS

Transportation of collected paint wastes is regulated. Even though there is an exemption for HHW under federal regulations, some state RCRA regulations require that the transportation of collected household wastes from the collection locations to recycling sites be handled by permitted waste haulers. If a paint manufacturer was to handle the transportation, he would have to obtain a waste haulers permit or obtain a variance from the state RCRA agency. Both of these options involve time and expense and expose the company to additional liability.

Storage of the collected paint wastes is regulated. In order to receive and store any hazardous consumer paint wastes, a paint manufacturer would be required to have a hazardous waste storage facility permit. This is also a very time-consuming and expensive undertaking which includes a public hearing. Due to the expense and increased liability exposure, few paint manufacturers have obtained hazardous waste storage facility permits.

Another major concern is the labeling of reprocessed paints. Because of the unknown materials the labeling of these products is very suspect. To properly label these products a manufacturer has to run some very expensive analytical tests.

There are concerns about meeting such requirements as the Consumer Product Safety Act, the Federal Hazardous Substance Act and California's new Proposition 65. These laws require that the proper labeling of the materials. Without knowing what is in consolidated paint waste coming in, there is a real problem in labeling the resulting product properly.

There are also product liability concerns. To address these concerns very extensive and costly tests are required.

## ECONOMIC CONCERNS

Recycling/reprocessing is very labor intensive. Testing these materials to determine the amount of resins, solvents, pigments needed to turn them into semi-usable products requires a great deal of labor. There is the major difficulty of a lack of a market for the end product. Recycling paint is not a viable alternative.

What are the alternatives? There is a need for more consumer education on source reduction, on proper buying of paint, on reuse of paint through exchange programs, on the waste management of what residual products a consumer has to dispose of through methods such as solidification. NPCA is preparing a point of sales bulletin that will discuss source reduction, reuse of waste, and disposal. It is to be available for distribution through NPCA members sometime in early 1988. NPCA sees education is the key to minimizing HHW as well as ensuring proper HHW management.

## PESTICIDES

Janet Auerbach, Chief, Special Review Branch, Office of Pesticide Programs, U.S. EPA, Washington, DC.

Any product that is sold to be used as a pesticide is regulated under the national pesticide law which goes by the initials FIFRA (Federal Insecticide, Fungicide, Rodenticide Act).

Many think of pesticides as synonymous with insecticides. In fact, the definition is much broader than that. It includes herbicides, slimicides (used in industrial and other settings), and disinfectants (used in hospitals, restaurants, the home). In the home the definition is quite broad. It goes from spray insect repellent, toilet bowl cleaners, drain openers, to bleaches, treated shelf paper, flea collars.

In 1983, EPA began to address the problem of disposal of household pesticides in a coordinated way. In March 1983 EPA notified all registrants of pesticides that by December 1985 they had to re-label all their products to make sure that consistent guidance on storage and disposal of pesticides was provided on the label.

That is the origin of the statement that consumers can see on all products intended for household use. It says that if there is still pesticide in the container when you dispose of it you have to wrap it in newspaper and throw it in the trash. If the container is empty you do not have to wrap it in newspaper but you are still told to throw it in the trash. The genesis of that guidance was not because the pesticide program at the EPA had any in-depth knowledge that this was the best thing to do environmentally, but that it was the only advice they had to give at the time.

On products used by professional applicators there is a statement to consult with the state health department but that statement was not put on household products.

Certain questions were then addressed. The first question was: what can be done about dioxin-containing household wastes?

Auerbach said that many of the household pesticide products used around the house contain dioxin of one form or another. Fortunately, many of them have been suspended and cancelled. Perhaps some are still available, but not for much longer. The two major ones being, 2, 4, 5-T and Silvex, which was suspended by the EPA back in 1979. Very little of it is still found for ssle. Some other products like pentachlorphenol which is used as a wood preservative, 2, 4 D, or bromoxynil, used as herbicides on home lawns, all of these have traces of dioxin in them. EPA recognizes that some clean-up days won't take dioxin-containing waste, but from the perspective of the Agency they are still the best way to deal with these wastes.

Can the government accept dioxin-containing wastes.

Auerbach stated that the government cannot accept pesticide wastes. There is one small exception which is that EPA is required to store and dispose of any pesticide that has been suspended under FIFRA. In regard to 2, 4, 5-T and Silvex products, which were banned in 1979, EPA began this year to accept its responsibility for those products. April, 1987, EPA put out a Federal Register notice announcing that whoever still had those products (user, retailer, wholesaler, manufacturer) could notify the Agency to ask them to take the waste and to indemnify them for what they paid for it. The notice went out in April. By July EPA had to be notified as to who had the product, the amount and the amount claimed for indemnification. Unfortunately, their budget has no money for this. They are working with the Office of Management and Budget to try to get money. Congress is considering riders on EPA's budget which would ensure that the EPA does not pay people for indemnification. The issue is still up in the air. The disposal part will probably take place soon.

The third question asked was what is the most environmentally sound way to deal with dioxin-containing wastes?

Auerbach deferred to Allen Maples, Office of Solid Waste, U.S. EPA, for the answer. Auerbach's office relies on the other divisions for technical advice. They are revising their regulations, and it will be a year or so before they are published. Many pesticides which are classified "acute" or "toxic" waste probably ought not to be disposed of in the rubbish. Under RCRA you are dealing with 100 percent of whatever product you have. In the home pesticide product usually there is 1 percent active ingredient. When they are diluted to that degree they probably would not be considered hazardous.

Working with the Office of Solid Waste they are coming out with a "mixtures rule" which ultimately may take some of these acutely hazardous pesticide wastes out of the Subtitle C mainstream. This is currently not the case.

A fourth question asked if the Office of Pesticide Programs recognizes the need for an educational program for consumers.

Auerbach's answer was yes. Historically, however, they have not seen their role so much on the educational side, instead the EPA has seen its role as a regulatory one. The evolution toward an educational agency is going on, and the pesticide program is a part of that. Consumers are one of the targeted groups but when budgets are tight, their emphasis has to be on regulation.

Evidence of this trend occured in August 1987 when the EPA put out a consumer information sheet on chlordane. Since chlorodane will not be banned, there will be an increase in the amount coming into collection programs. EPA is informing local governments to alert them to this problem. EPA is also encouraging consumers to use county or town clean-up days as a way of ensuring proper disposal of the banned chlordane.

# PESTICIDES

Johanne Gelinas, Program Agent, Community Health Department, Lakeshore General Hospital, Pointe-Claire, Quebec, Canada.

Domestic pesticide utilization represents a complex and difficult challenge to those involved in HHW management. Its resolution is not something which lends itself to a quick fix type of approach.

In coming to grips with the difficulties facing a planned intervention in the area of domestic pesticide use, it is necessary to consider three basic points.

- The widespread practice of this activity.
- The environmental and health consequences resulting from this practice.
- The social context of domestic pesticide use.

Domestic utilization of pesticides is in fact a very widespread practice. To give a concrete example of this, Gelinas referred to a a survey conducted of a number of suburban communities in the Greater Montreal area. They found that 80 percent of residents in single family dwellings regularly used pesticides in and around their house. One of the changing aspects of domestic pesticide use is that seven years ago in the province of Quebec there were only five firms specializing in domestic spraying. Six years later there were 180 such firms.

This widespread usage makes an important contribution to the problem of HHW management as can be appreciated by the results of the hazardous waste collection day, where 120 gallons of these products were collected. This represented seven percent of the total collection volume. It should be realized that this is for a participation of one percent of the target population. Apart from this relatively large volume it should also be appreciated that these domestic pesticides contain a number of very toxic substances.

It should be realized that this problem is much more than one of sheer volume or even dangerous material. What tends to complicate this issue is something which public health workers in a number of fields such as tobacco, alcohol, and handgun legislation have encountered, namely the social context which has been created for the utilization of these products. It is this aspect which makes a major contribution to this problem and deserves further reflection.

One important observation in this respect is that there is an uncritical acceptance of domestic pesticide use by large segments of the population. This is at least partially explained by the fact that for the most part the public is saturated with publicity depicting the use of those products as normal everyday activities. This is further reinforced by the jocular approach taken by a number of commercials. A good example of this are the commercials for RAID.

This situation leads to a number of difficulties. The most important is that these products are not perceived of as presenting any major hazard. The effects of this attitude are numerous. One is consumer apathy. The survey revealed that the majority of those who used pesticides did not even read the label for instructions or check the ingredients. Such a situation does not create a good atmosphere for either rational uses, safe disposal or a search for alternative products. Compounding this situation is a lack of readily available information regarding pesticide use. The survey also revealed that the major pesticide dispensers in Gelinas' area exhibited an almost universal lack of knowledge regarding pesticide ingredients, side effects, disposal, and alternatives. This was despite the fact that store personnel should function as an information resource to individual consumers. Two important consequences of this situation were observed.

One was the fact that at least 40 percent of the population was utilizing unsafe disposal practices for their domestic pesticides. Another was that 33 percent of survey respondents were using or storing pesticide products which had been taken off the market for safety reasons.

This information leads to the belief that the problem of pesticides as HHW material is part of a much larger, multi-faceted context and should not be looked at in isolation. Any meaningful long-term solution to this dilemma should not be limited to disposal practices, but rather should address the entire context of domestic pesticide utilization. Such an approach, to be successful, requires activity on a number of fronts.

One important facet of an effective strategy is a campaign of information and education on the various aspects of household pesticide utilization directed towards the public at large.

The emphasis of such a campaign should be on the rational use of these products, their environmental and health consequences, the various alternatives to their use which are presently available and methods for their safe disposal.

A number of approaches can be used to accomplish this. In Pointe-Claire their activities in this respect have included the publication of a manual for pesticide use (it was available at the conference as a hand-out). An event such as a HHW collection day is an excellent opportunity to begin or to reinforce an educational campaign in this regard.

Another important consideration is the active encouragement of groups or individuals in the community who are interested or already involved in the promotion of safe or alternative pesticide practice. An ecology group at their HHW collection day explained alternative methods. On the individual level a certificate is given to those who participate.

Additionally, an effort should be made to apply pressure on the commercial outlets selling pesticides to have more information for the general public as well as having personnel who are more informed in relation to this subject. Two interesting developments have occurred since they began their activities. First, the largest domestic pesticide firm in the area has seen a 20 percent drop in demand. Secondly, a number of municipalities have stopped or restricted their use of pesticides.

Gelinas did not suggest dictating a rigid plan of intervention. She urged taking a global approach to this problem.

## DIOXINS

Allen Maples, Environmental Scientist, Office of Solid Waste, U.S. EPA, Washington, D.C.

Maples spoke on the EPA's perspective on what to do with dioxin-containing HHW.

In general, as indicated in the EPA's policy statement on the management of HHW, these materials are exempt by regulation from Subtitle C, the hazardous waste rules of RCRA, because of the household exclusion. This is important to keep in mind, Maples stressed. HHW can legally go to Subtitle D or solid waste facilities, since HHW is a solid waste by definition. This is the regulatory position.

As a policy position EPA recommends that these materials be handled as a Subtitle C hazardous waste. The reasons being that the communities have gone to the trouble and expense of collecting these materials, and licensed hazardous waste facilities provide a greater level of environmental protection.

How will those regulations impact forms of dioxin coming into collection days?

EPA's hazardous waste rules on dioxin-containing waste do not apply to any HHW because of the exclusion. The Subtitle C rules for dioxin apply only to those dioxin-containing wastes that are specifically listed as a hazardous waste in the regulations, 40 CFR Part 261. Because of the household exclusion, dioxin-containing HHW can legally go to a D-facility. However EPA recommends that it be handled at a hazardous waste facility.

## THE CURRENT SITUATION

As many speakers at the conference noted, many sponsors of collection programs are refusing to accept dioxin-containing HHW and are turning it back to the homeowner. This is an unfortunate situation for a number of reasons. One reason is that it leaves the homeowner with the question of what to do with the wastes after being turned away from a collection program. If the collection program won't take it, it must be a problem! It creates the potential problem of indiscriminate disposal of these wastes.

The hazardous waste management companies, owners, and operators of hazardous waste landfills or incinerators have not been accepting dioxin-containing HHW for disposal or treatment. Maples believes that this is largely due to the public perception of the risk of handling dioxins. This is despite the fact that proven technology exists for destroying the wastes in high temperature incinerators. (This means that it meets the EPA requirements for 99.9999 or six 9s for destruction removal efficiency.)

Neither the land ban nor the dioxin listing regulations apply to HHW with suspected dioxins. Waste management companies are not prohibited from accepting these wastes.

## FIXES OR SOLUTIONS

Unfortunately there are no magic ones. EPA strongly encourages the waste management industry to reconsider its position on this issue. The best way to manage these wastes is through the services, knowledge, and experience of hazardous waste management companies. Until this happens the only option seems to be temporary storage of these materials. This storage is usually done by the companies involved in clean-up days. They are kept at a transfer facility or a similar facility. Maples concluded by inviting suggestions for ways in which this problem can be dealt with.

# DIOXINS

Liz McCormick, Manager, Household Hazardous Wastes, GSX Chemical Services Inc., Columbia, SC

McCormick gave the views of a commercial hazardous waste management company on the matter of dioxins, a different view from that of the EPA.

Her firm, GSX, has done a number of HHW collection programs. The company has refused to handle dioxins on a routine basis. Before going on, McCormick pointed out that it is important to understand that dioxin is not a single compound. When talking about the problem of dioxin it is in reference to two general classes of compounds. One of them are the dioxins, the other the dibenzofurans. These compounds have in common that they are chlorinated, at least two organic ring compounds hung together, a miscellaneous assortment of many chlorines hung together. Where do these compounds come from? They are not naturally formed. This is not something God did, man did it. Simplistically stated, this is something that seems to result from the high temperature incineration or high temperature interreaction between fairly complex organics and chlorine or chlorinated compounds. Examples of this come during the production of herbicides and wood preservatives, municipal refuse incineration, bleaching pulp papers, etc.

As a group these compounds seem to be reasonably stable. Having been formed at high temperatures they do not break down easily. There is incredible variation in their characteristics. The toxicity varies dramatically from one compound to another, both in the size of dose needed to cause a problem, and the sensitivity of the species that is a target. Some of the dioxins approach the botulinus toxin in their toxicity. Some of them do not. As a group there is great concern over them. Recently,it has appeared that the dioxins in general are fairly immobile in soil. A great deal of research is going on. Much of it is contradictory. Much of it is unclear. There are no firm answers to questions about the degree of danger of dioxins at this point.

## DETECTION LEVELS FOR DIOXINS

Over the last few years this has changed considerably. Originally, it was parts per million. Next it was detected in parts per billion, and now it is in parts per trillion. With sensitive lab equipment dioxins have been found in many more places. They are turning up just about everywhere. They are in household pesticides that are still on the market. At what levels and of which particular variety is unclear. The more dioxin is looked for the more it is found.

## DISPOSAL SITES FOR DIOXINS

Finding a disposal site is a problem. None in the United States are currently accepting dioxins. It does not mean that the sites are not technologically capable of reducing or eliminating to a certain extent the dioxin. They are not permitted and not commercially available.

Incinerators are not perfect. One of the better ones which handles PCBs can get six 9's destruction, that means 99.9999 percent destruction efficiency. This means that .0001 percent is left, which translates to a part per million. Detectable levels will remain after incineration.

Current sites can significantly reduce dioxin in a given waste stream, but there is no technology that can eliminate it and make it zero. There is no doubt that it is better than an uncontrolled municipal landfill, but there is not a system now that will result in zero remaining dioxin. What is available now is a very high efficiency reduction system. However as the detection systems have been more sensitive those very low remaining amounts have become more and more of concern. There is a convergence here between the ability to find dioxin and concern over it.

If it is possible to reduce dioxins so effectively why isn't it being done? The commercial facilities are often viewed with suspicion, at best, and usually with antagonism. Anyone making a living off of commercial hazardous waste management is generally viewed as anti-environmental and faces many problems when it comes to siting a facility. How many new commercial hazardous waste management facilities of any sort have been there been in the last few years? The answer is very few. Most existing sites have had interim status, they have been upgraded, they have been changed. There are not many new sites. Many existing sites are prohibited by their permits from accepting these materials. This is not on an EPA-level. EPA would welcome facilities managing these materials. Most facilities are regulated under more stringent state permits. In many cases, it is the type of waste, not the source that is of concern. Restrictions are based on the nature of the waste. If a facility is forbidden to take a commercial dioxin-containing waste, it is pretty much forbidden from accepting dioxin-bearing wastes from households. Many of GSX's facilities have these prohibitions not just on their incinerators, not just their landfills but also on their transfer facilities where they do temporary storage in transit to final disposal. Specific prohibitions written by the states say "Thou shalt not store dioxin."

The issue becomes politics rather than technological reality. The public's impressions count, and they are important to reputable hazardous waste firms. Dioxins are currently the "death of the month club" candidate. They are the most politically sensitive material around. The reputable firms are deeply unwilling to accept even more negative publicity and negative impressions. The situation now for dioxins is similar to the situation for PCBs in the early 80's, when there were no commercial sites available. What is going to be the outcome in the US? There is no bright star on the horizon. Perhaps when there is an even more sinister "compound of the month" to replace dioxins, some sites will open up to dioxins. Or perhaps some firm will risk the adverse publicity and adverse hearings and findings to be the first to accept dioxins. There is also the hope for public help and participation in siting new facilities. This is the best hope for now. The HHW collection programs help to educate the public: one aspect is getting the public to think about where these hazardous materials will go if there are no commercial facilities to send them to.

## WHAT TO DO FOR NOW

Everyone knows that dioxins do come in at HHW collection events. They are in herbicides and wood preservatives, particularly. There is the possibility that facilities in neighboring countries where the concern over dioxins is not as great will accept these wastes. McCormick's personal view is that that is irresponsible, just as exporting DDT to other countries is. This is not responsible management of our problem. In the meantime, sponsors can take advantage of the EPA's loophole and hold the dioxins. Many transfer facilities and contractors will not be able to store these wastes. EPA says it is not a RCRA waste. Why go through the part B process if you are able to hold on to the wastes? Security, secondary containment, and safety precautions would be very important. For the moment, storage is the best alternative.

## UNKNOWNS

Robert Turkington, Industrial Hygienist, Haz-Tech Systems, Mountain View, CA

Turkington is a specialist in identifying unknown materials. Without being able to give a specific number to the amounts of unknown materials likely to come in to a HHW collection program in his experience has received at least 100 materials per clean-up.

### BACKGROUND ON THE SYSTEM FOR IDENTIFYING UNKNOWNS

Turkington was hired by the CA Division of Occupational Health and Safety Administration (OSHA) to do a research project to determine what the risks were to emergency responders in the line of duty. Part of the project involved keeping a list of all the materials that were encountered in the state of California in emergency situations over a four year period. It became obvious early on that although there were roughly 2,000 events a year, there were approximately 200 materials that showed up over and over again. Environmental Canada is the only other group that has done this kind of research. They kept track of spills in Canada over a three-year period. The Canadian list was amazingly similar to the one compiled in California.

Turkington went on to describe the system he devised which uses a decision tree chart.

He concluded by pointing out that the biggest disadvantage when unknowns are identified at a clean-up is that the contractor sometimes finds special handling must be given to an aromatic or a chlorinated material that had been thought to be a solvent. The contractor may be unhappy about this, however, for the sponsor who is taking the liability for what is in the lab-pack, this added knowledge can be very helpful.

# LAND BANS

Allen Maples, Environmental Scientist, Office of Solid Waste, U.S. EPA, Washington, DC.

Maples gave a brief presentation on EPA's disposal restrictions ban and its implications for the HHW collection programs.

## BACKGROUND: LAND DISPOSAL RESTRICTIONS PROGRAM

The Hazardous and Solid Waste Amendments (HSWA) were enacted in November, 1984 and amended the Resource Conservation and Recovery Act (RCRA) of 1976. Among other things, these far-reaching amendments require EPA to evaluate all hazardous wastes according to a strict schedule to determine whether land disposal of these materials is protective of human health and the environment. For wastes that are restricted from land disposal, the amendments require EPA to set levels or methods of treatment, which EPA calls BDAT, Best Demonstrated Available Technology. Using BDAT a waste's toxicity will be substantially diminished or the likelihood of the migration of a waste's hazardous constituents will be reduced. Beyond specified dates, restricted wastes which do not meet the treatment standards are prohibited from land disposal. According to HSWA, if EPA fails to set treatment standards for a particular waste by specified deadlines, that waste is automatically prohibited from land disposal. These so-called "hammer provisions" provide impetus for EPA to keep to the strict schedule.

## WHAT HAS HAPPEND TO DATE:

November 8, 1986. EPA published a final rule for wastes restricted from land disposal. Banned were:

- o Dioxin-containing listed wastes (F020, F021, F022, F023, F026, F027, F028).
- o Spent solvents (F001, F002, F003, F004, F005)

By July 8, 1987 EPA published its second final rule which covered the CA listed wastes. Included on the list:

- o Liquid hazardous wastes containing 4 groups:
  Free cyanides
  PCBs
  Corrosives
  Certain metals
- o Hazardous wastes containing hazardous organic compounds (HOCs), also part of the California list.

## THE FUTURE

EPA is required by August 8, 1988 to evaluate at least one-third of all listed hazardous wastes

By November 8, 1988 to evaluate contaminated soil and debris from:

CERCLA response actions

RCRA corrective actions

By June 8, 1989 to evaluate at least two thirds of all listed hazardous wastes

By May 8, 1990 to evaluate all remaining listed wastes and all characteristic wastes.

Newly listed wastes will be evaluated within 6 months of identification or listing. (No "hammer provisions")

Land disposal -- what does the term include? Land disposal includes but is not limited to:

- Landfills
- Surface impoundments
- Land treatment
- Injection wells
- Waste piles
- Salt domes
- Underground mines or caves
- Concrete vaults or bunkers

Land disposal restrictions do not apply to:

- Small quantity or conditionally exempt generators of less than 100 kg per month or
- Wastes disposed prior to November 8, 1986.

## HOW DOES THIS RELATE TO HHW?

The situation is similar to what has been discussed earlier at the conference. The land ban only applies to Subtitle C wastes. HHW are exempt from Subtitle C. There is one instance that might arise in which a low pH waste, on the CA list, might come into a collection day. The hazardous waste landfill owner/operator might refuse to take the waste, in spite of the HHW exemption, because of the land disposal restrictions. In that case, the waste could be treated to raise the pH or to be solidified. This is an example of using BDAT. After treatment, the waste with the higher pH could be landfilled in accordance with restriction program.

# OVERVIEW OF FUTURE FUNDING OPTIONS

## INTRODUCTION

Gina Purin, Moderator, Golden Empire Health Planning Center, Sacramento, CA.

Purin introduced this section of the meeting by explaining that typically, and particularly in California, the revenue for running a collection program has come from an increase in the refuse collection fee, the water quality bill, or the use of tipping fees. These are appropriate funding methods since concerns about HHW arose out of concern for refuse worker injuries, water quality and contamination of the landfill.

Because funding options were to be covered in the final session, the focus of Purin's session on funding had to do with taxing as a way of gaining funding for collection programs. In addition, European methods were to be presented. Before introducing the first speaker, Purin briefly reviewed some of the less frequently used or proposed options for generating funds, such as the Iowa legislation requiring retailers to purchase a permit to sell certain products, the revenue gained helping to pay for collection events; the deposit idea to encourage the return of certain products or product containers; the placing of a tax on non-recyclable containers, such as aerosol cans; or the Florida Trust Fund, which helps to fund collection programs by placing a two cents per barrel tax on items imported into Florida, items like gasoline, oil, pesticides, to replenish the Trust Fund whenever it falls below a certain value.

The best way to fund collection programs, in the view of many people, is a state excise tax, which is really a user fee. It follows from the basic principle that those who profit from the use of a product should pay. The consumer becomes involved in the safe management of a hazardous product by paying a few cents in the purchase price of the product.

Before opposing views on the excise tax concept were presented by Donald Lofty and Jolene Unsoeld, European funding methods and a proposal for a new method were presented by Dr. Gerhard Vogel.

## INTERNATIONAL METHODS

Gerhard Vogel, Assistant Professor, Institute for Technology and Commodity Science, University of Economics and Business Administration, Vienna, Austria.

Vogel reviewed the results of different methods to collect separate hazardous waste materials. The smallest amounts collected are from a single collection event. Better results are shown for regular collection systems, such as they have in Vienna, Austria.

Vogel believes that a system should be used that results in a high percentage of separate, reconcentrated substances that can be recycled. Large amounts of homogeneous materials should be gathered. If there is agreement with the objective of a high percentage of hazardous waste materials, reconcentrated in a homogeneous form, then, in his opinion, economic incentives should be implemented.

In presenting his new concept, Vogel referred to the bottle bill system. In the U.S. system the consumer has the economic incentive to recover the deposit he has paid. The distributor is not so interested in having all the bottles returned, since he makes money from the difference between what the consumer paid in and what he has to pay back. Under this system the deposit is paid by 100 percent of the consumers. The amount of deposit money paid back is between 70 percent and 90 percent. Although this makes it possible for the distributor take on some of the treatment costs for bottles and plastics, there is no incentive to recover all the materials.

In addition, citing the situation in Europe, he said that retailers do not accept hazardous materials. They do not want to become the waste managers of the nation, and they do not want all the materials to be given at the retail level. Therefore retailers are opposing all deposit systems or taxing systems.

Vogel outlined a proposal to counteract the disincentives for reconcentration of materials. Although similar to the bottle bill system there are major differences. The consumer buys a commodity, having to pay the price of the product, as well as the deposit and money for the treatment of products. Refer to Exhibit 8. For example, this would deal with hazardous waste materials such as batteries. The producer when sending products out into the market would have to pay deposit and treatment fees to an official government fund.

Currently, when the consumer wishes to return materials, a procedure resisted by the retailer, the economic incentive works to the benefit of the consumer. Under his proposal, the collector of the waste brings it back to the producer and

Exhibit 8

## The Costs of Different Collection Systems

In some European countries separate collection programs of hazardous waste materials is often part of the positive, environmentally orientated image of politicians. So-called cleansing programs ("let's detoxify our waste") entail wide publicity. This might be one reason for the fact that there are almost no data on the costs of such programs.

Nevertheless, the following basic considerations originating in the Law of Entropy apply:

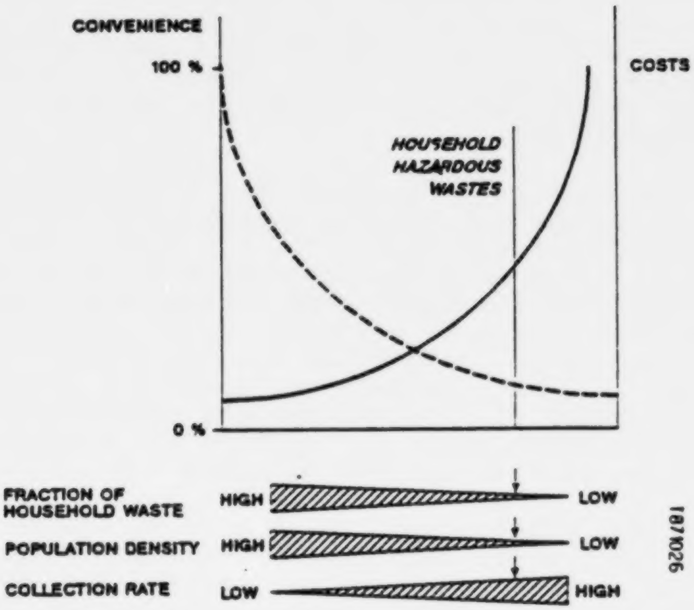


Fig. 8: **The relationship between costs and convenience in hazardous waste collection**

Source: Gerhard Vogel

receives money from the official government fund. If the system works well, it differs from the other system because the producer has an interest in having the materials brought back because the producer has paid money for deposit and treatment. Producers will advertise and begin to institute treatment. In other words, the system would change. Vogel pointed out that by adding additional treatment costs, the new equalizing point would be higher, with lower quantities and higher prices. Therefore, producers are afraid to use this system.

The other side of the agrument is that if such a system is not used the products which are not environmentally safe are not recovered in an environmentally sound way. With the implementation of fees for treatment there is a new tool for environmental protection.

## EXCISE TAX OPPONENT

Donald Lofty, General Counsel, Drackett Company, Cincinnati, OH

Should an excise tax be imposed on porducts which when discarded are considered hazardous waste? Lofty suggested that first the question should be examined before considering the answer. He expressed the hope that he would leave people with as many questions as answers. Pointing out that lawyers always make disclaimers he stated that the views expressed were his own, not those of his company or of the industry as a whole.

First, Lofty described the Drackett Company. They are a manufacturer of home-care and cleaning products, based in Cincinnati, Ohio. The company has been doing business for 75 years. Many of its products have become household names such as Windex window cleaner, Vanish toilet bowl cleaner Drano drain opener Renuzit air freshener.

Lofty said that he was not sure how many, if any, of Drackett's products would be regarded as a potential HHW and would be subject to an excise tax if such a proposal was adopted.

Presumably some people would like to see some of Drackett's products included in such a tax. He directed his remarks to their types of products and those of their industry since he is not an expert on other materials such as used oil, batteries, etc.

The people at Drackett are concerned about proposed labeling requirements for their products which require people to use special and very expensive disposal procedures. They are also concerned about taxes that would be used to pay for those procedures. He stressed that Drackett is not unwilling to change their products when the situation warrants. The company supports the views of Dr. Etter (see "Reformulation" under overview of other management options) on reformulation. Drackett was one of the first companies in America to put child-resistant closures on their consumer products, long before the government required them to. They continue to put such closures on products, regardless of whether the government requires it.

Before the imposition of additional burdens on consumers and additional expenses Drackett asks that it be shown that this serves some higher social purpose. This position raises the next question which is at the starting point of this issue and that is what are we going to do with the garbage barge from New York City which threatened to become, as Lofty put it, the modern equivalent of the "Flying Dutchman," a ship condemned to roam the seas unable to find a port. In the barge example the waste was non-hazardous municipal waste. In the case of hazardous waste the issue is even more difficult. No new landfills are being built. Permitting of incineration is highly problematical. In general, the public takes the attitude "Don't build it in my backyard." The solution is to pack up the waste and take it where there is less vigilance in environmental matters.

Should there be an excise tax which would divert portions of the municipal waste to the hazardous waste stream? Mentioning that policy issues would be addressed later in his talk first the question of the advantages of such a plan outweighing the disadvantages of diverting waste from the scarce municipal waste facility to an even scarer hazardous waste facility were addressed. One benefit that has been suggested is that it would protect sanitation workers. However, according to data developed by the National Institute of Occupational Safety and Health, most injuries to sanitation workers fall into the categories of back injuries or traffic accidents. There are anecdotes about injuries that appear to be caused by chemicals, usually unidentified. Lofty suggested that more data is needed in this area before a new program, and a new tax is created.

People have suggested that public education programs on toxic and hazardous materials is an important benefit of these programs. No one could disagree that public education is generally a very good benefit, and it is particularly good when once we have decided what we are going to educate people about. For him, there is a question about whether this problem and its ramifications have been adequately defined in order to know that we are going to be educating them correctly. More to the point, Lofty suggested, the products and issues covered in such a public education program are far broader than that which would be justified by levying a tax on a rather narrow category of products.

The next question Lofty looked at was the matter of environmental benefits. To some it is an objective to remove hazardous chemicals from the waste stream. Again although this is a view that is not easy to disagree with, there are some questions about whether diverting these so-called hazardous household wastes which, according the discussion at Monday's session, represent less than one percent of the total waste stream, would have the desired effect of improving the quality of the leachate and gas emissions from landfills. There have been studies done on some kinds of hazardous waste, specifically on corrosives and caustics. These have been injected into simulated landfills and in the acidic and highly buffered chemical environment of the landfill have not appreciably affected the pH of the leachate which comes out. In short, more needs to be known. From Lofty's personal point of view, industry can and should participate in the process of finding the answers to these questions. Industry is willing to work with governments, private groups.

If all the HHW could be gotten out of landfills what would be the result? Would the landfill leachate then be safe and could it commingle with the groundwater? According to Lofty the answer seems to be no. There would still be newspapers and other materials in the landfill which have chemicals and inks which dissolve into the leachate. Construction and auto parts would still disintegrate into the leachate. Municipal sludge in many landfills would still contain heavy metals which come from industrial users. Just by eliminating household hazardous waste from municipal waste the modern day "Flying Dutchman" cannot be escaped. The question remains what is it to be done with all the garbage?

There is no complete answer to this question. People should be aware however that RCRA, Subtitle D, represents a program and an effort to deal with the problem on a larger scale. It requires that states develop programs to convert their municipal waste facilities to sanitary landfills which will be run in such a way that they will not threaten human health or the environment. There are now 25 states which have had plans accepted by the US EPA to achieve this end. It is of special note that California and Washington are among the leaders in that process.

There are questions specifically about the fairness of the tax. Deadly toxins such as arsenic and strychnine, and even ammunition and explosives, which are difficult to tax, are brought into landfills. Should household cleaning products and auto care products bear the burden for the disposal of other products as well as themselves? Another question is whether a uniform tax can take into account the different contributions to this perceived problem. In general, household cleaning products can be poured down the drain or sprayed into the air when they are used. They are not normally discarded in substantial quantities, whereas paints may be disposed of in larger quantities and used motor oil almost always will be.

Lofty covered a number of points in the realm of tax policy especially in regard to an excise tax. From his understanding of the proposed excise tax the money will be earmarked for disposal of specific products. Earmarking funds is generally regarded as bad tax policy, because you run the risk that the program will be underfunded or overfunded. The idea of being overfunded may sound attractive, but there is the possibility that the program becomes a "sacred cow" and is not looked at as carefully as it ought to be to see if it is the best way to spend the taxpayer's money. The other problem with an excise tax is that the tax is hidden from the consumer. This would be particularly true if the tax was imposed at the wholesale level. A hidden tax may seem advantageous from a politician's or an administrator's point of view, but Lofty believes the American taxpayer would not see it that way.

Generally, Americans like to know what taxes they are paying and how much they are. There are income tax forms, sales tax receipts, and property tax bills so that Americans can know about their taxes. There are some excise taxes on items such as alcohol, tobacco and gasline, but these are exceptions. At this point there is no justification for creating a new one.

What are the implications of this program for how we dispose of our waste, how we pay for the disposal? Traditionally, we have paid for the waste when it is being disposed. If there is going to be a change in that policy there is going to be a charge included for the cost of disposal of a product this represents a major break with what has been the practice. It deserves more consideration than just a limited look at a single program which has not been considered in the context of the whole waste disposal and tax structure.

In conclusion if the question is should we have an excise tax to fund HHW disposal programs then the answer is that sound tax policy considerations would say no. If, on the other hand, the question is one of whether such programs can contribute to America's ability to solve its overall waste disposal problem Lofty's answer is that we don't know yet. Industry is prepared to work with governments and responsible private groups to find out.

## EXCISE TAX PROPONENT

**State Representative Jolene Unsoeld, State of Washington.**

Unsoeld began by asking for a show of hands for various categories -- federal, state, local government employees, private industry representatives and so forth and observed that there was a good smattering of people from all over. She said she is the "wicked witch of the North" from industry's point of view. She expressed the hope that after her talk she would keep the title.

Unsoeld has been the leader in the area of HHW legislation in Washington State over the past year and a half. She got interested in it because she had a gallon can of concentrated penta that sprang a leak in the seam and created a major hazardous waste site in her own garage. Batteries from her tape recorder and paint thinner for cleaning paint brushes also posed problems. HHW is too narrow a title. She asked people to think of hazardous waste in a cosmic perspective. For example, the subject of plastics had not been discussed. At the hotel the newspaper was left at your door in plastic. Perhaps not a hazardous waste, but a hazardous to the environment nonetheless.

Without looking at the 'big picture' it will be difficult for those looking for funding to cover their HHW programs to compete with the other problems and solutions for hazardous issues. In Washington, the legislature adopts excellent programs, but does not give 1 penny for implementation. It is no wonder that these programs do not work. Washington has a billion dollar problem, which must be looked at from the standpoint of a century. 60 years went into building the problem, 40 years will be needed to solve it.

There are lots of unfunded programs, examples of such unfunded programs are: local planning, education, technical assistance for waste reduction, recycling, minimal functional standards for future municipal landfills so they do not become bad neighbors, HHW programs, technical assistance for small businesses and unregulated hazardous waste. Agricultural chemicals are a problem. Sheriffs in Washington are having trouble disposing of materials they collect from busts of illegal drug labs. Hazardous material emergency response, drinking water testing, health monitoring for those living near a hazardous waste site, and the clean-up of municipal landfills are also problems. Local governments do not have the option to raise money to meet the requirements of cleaning up problems.

What has been the Washington experience with taxes? Having had a lot of experience with failed measures to raise taxes, Unsoeld described some of her efforts. The first attempt was an excise tax on household hazardous substances, similar to the tax stamp which appears on a package of cigarettes. That was shot down fast, primarily because of the stamping. The next effort was a property tax, 25¢ on $1,000, for a statewide water quality financing program. This measure never made it out of the state senate. They were pretty unwilling to vote for taxes. She was successful in establishing the principle that a major clean-up or major programs dealing with pollution could not be passed without having the money to go with them.

The next year an increase in the cigarette tax was passed. Although there is no correlation between clean water and cigarettes, money is money. In 1987, Unsoeld tried a toxics control act. She pulled together all the unfunded programs that were on the books, figured out what they would cost, and decided that that was the amount that would have to be raised. (Leaking underground storage tanks were not included. She now regrets that omission.) Not all taxes to society are shown. When a citizen buys a product which ends up contaminating the groundwater the tax to society cannot be calculated. This is the issue that must be addressed.

What are the options? A tax can be placed on the disposal of these materials, with tipping fees, etc. Unsoeld pointed out that in some of their unincorporated communities the cost of garbage disposal is based on what the citizen uses. If the cost is too high, the homeowner may well take the waste and dispose of it improperly.

As for industry, she has a problem with their attitude, which is to deny that there is a problem ("It's only one percent of what goes into the landfill"). They do not want to have their products labeled "hazardous." There has been a lot of discussion in Washington about petroleum products. Industry calls it a "consumer product, not a hazardous substance." Still when did we ever hear of anyone drinking it? One gallon will contaminate 1 million gallons of drinking water. Legislation failed, because of industry's opposition. An initiative campaign was mounted, which got business's attention. They spent $160,000 on a single attorney/lobbyist in order to get a special session to try to subvert the initiative. They succeeded in getting a special session on October 10, 1987. A hazardous waste clean-up measure was passed, but it is seriously underfunded. It incorporates many of the things that were in the initiative.

Fees. Many say it's a popular idea. Why not place a fee on hazardous waste generators or those who discharge hazardous wastes into the water? The problem always arises when it comes time to set the rates. There is always resistance.

General taxes. To think of general revenues as a source for funding these programs is not realistic. Does any industry seriously support new taxes?

Washington adopted a poisons tax. It is the first state in the Union to impose a tax on the sale of hazardous substances. It is 8 percent (8 tenths of 1 percent) on the first possession of chemicals, solvents, petroleum products, pesticides, fertilizers,etc. Who pays it? The manufacturers and the distributors who bring those toxic substances into the state. It is paid on the wholesale value of those substances. Subsequent resales are exempted. In her initiative it raised $35 million per year. In the legislation that passed it raises $26 million per year, which is enough money to pay for the clean-up and hopefully the rest of the program (e.g. management, education,prevention, local government grants). It ensures that the people who actually buy and use the substances pay for the management program. Thus the tax meets all the criteria of a fair and efficient tax. In conclusion, Unsoeld offered her support to help other states adopt the same concept.

# EDUCATION PANEL

Panelists: Leslie Lewis, Joanne Foster, and David Harris, Jack Lord, moderator.

## Jack Lord, opening remarks

Public education plays a peculiarly important role in HHW management, because it is not only one of the means by which such management is accomplished, but also one of its ends.

Education is essential to the means. No program for minimizing or removing hazardous wastes from homes can operate, much less succeed, without a strong educational component. At the present time the general public is scarcely conscious of the existence of these wastes or the potential problems they pose. Simple consciousness of the problem is not enough, however, because the management of HHW requires that the general public perform some tasks that require skill. For example, people need to be able to identify specific classes of products, such as motor oil, that require special care in disposal. A program that operates a collection site must find a way to communicate to the community not only why but also where and when -- and do that very clearly -- as well as how wastes may be safely transported. In short, without public education, HHW management would be a party to which no one comes.

Public education is also one of the goals of HHW management. Men, women, and children learn best by doing; if HHW collection took place in a classroom teachers would call it a hands-on activity. It is an effective "learning experience." Exactly what it teaches varies with the perspective of the observer. To many public servants, a major value of HHW programs is that they educate the public about the kinds of difficulties waste management and toxic control planners currently face. For example, Felix Harvey mentioned that he considers collection programs an educational tool for the process of siting hazardous waste facilities. In the keynote address, Joseph Carra of the EPA, stressed that the broad educational effects of the HHW programs are a major reason for EPA's support of efforts such as this conference.

Persons in industry often see HHW collection as a way of teaching the public that hazardous materials are not simply industry's problem. The process of facing up to managing one's household wastes responsibly can lead to a better appreciation of the trade-offs industry makes in reducing or treating its hazardous wastes. We're all in this together. You have heard several representatives from industry express such sentiments in the presentations yesterday and today.

Finally, consumer advocates and environmentalist groups often feel that HHW programs help to educate the public about the extent to which we are salting the earth and poisoning our wells. I believe that all three of these points of view are correct, and their diversity is an indication of the educational importance of these programs.

The panel presenters are three individuals who have been personally responsible for large, successful, public information elements of HHW programs. One is with a state agency, one with the League of Women Voters, and one with a nonprofit environmental group working under contract to a local government -- Their combined experience is not only deep but broad.

Leslie Lewis, Citizens Participation Coordinator, State of CT

When we started the HHW program in CT, we knew we needed to get good information out to the public. We also knew that we didn't have the staff or the financial resources to develop new materials. In looking at the kinds of materials already available, we found that the Pioneer Valley Planning Commission in Springfield, MA had produced a brochure on organizing community collection days. We asked for permission to reprint the brochure, making changes specific to CT. They responded positively, asking only that we credit them as the source. We obtained similar permission to use a general information flyer from a RI garden club and school curriculum materials from the Golden Empire Health Planning Center in CA.

The new bibliography which has been prepared by the Center for Environmental Management at Tufts University will be invaluable to anyone looking for information on HHW. It has three sections which are:

- general materials;
- state reports and brochures;
- fate of HHW materials.

It is the most comprehenisve compilation of books, pamphlets, articles and reports to be produced to date. If our experience in CT is representative, it should not be difficult to utilize existing materials if credit is given to the original source. Tufts is eager to learn of new materials which should be added to the bibliography. In the small world of HHW, there is a wealth of good information. There is no need to reinvent the wheel.

Joanne Foster, Natural Resources Director, CT League of Women Voters.

Foster's presentation referred to a display board exhibiting many examples of HHW materials. These materials represented a cross-section of available materials and were organized by state.

Basic guidelines for printed materials and other educational approaches for the issue of HHW:

## COMMUNITY EDUCATION

A. Printed materials -- development and distribution of brochures, collection schedules, fact sheets, posters, etc.

B. Information and referral services -- a center for providing information to phone callers regarding the HHW program and services and for dessemination of printed materials.

C. Mass-media education -- provide information through a variety of formats -- articles, press releases, PSAs, and public affairs programs -- and utilization of a variety of media -- community and employee newsletters, newspapers, magazines, radio and television.

D. Group presentations -- development of a slideshow and/or video program on HHW for presentation to civic groups, community organizations, garden clubs, senior groups, school classes, etc.

E. Public events -- provide information at large public events and in public places including fairs, shopping malls, and collection events.

## TARGETED EDUCATION

A. Worker training -- specialized training for groups directly affected by HHW including refuse collectors, landfill tractor operators, and tipping fee collectors, who in turn can educate the public.

1. Information dissemination by refuse collectors using stickers, tags, bags, etc. to inform residents who are disposing of toxics in the trash.
2. Billing inserts by refuse collection companies or agencies to their customers.
3. Brochures/schedules distributed by tipping fee collectors to landfill users.

## SPECIAL EVENTS AND PROJECTS

A. "Home Safe Home" open house event involving displays throughout a home on household toxics, collection programs, and safe substitutes.

B. Press conference, e.g., a demonstration of dangers to refuse collectors when trash trucks compact containers of liquid toxics, interviews with injured workers.

C. Model household toxics use reduction project -- reduce the use of household toxics in a public facility, school, or other appropriate building to demonstrate the feasibility and cost-effectiveness of using safe substitutes.

D. Graphic art panels -- construct and paint portable panels which illustrate in graphics and words the goals of HHW programs. Put on display at collection days, shopping malls, and public events.

## COLLECTION DAY/SITE EDUCATION AND OUTREACH

A. Group presentations, a mass-media campaign, and targeted brochure/schedule distribution for specific collection events or permanent collection sites.

B. Other proven and creative methods of outreach including banners, billboards, direct mail, billing inserts, door hangers, advertisements, and...

## SCHOOLS PROGRAM

A. Curriculum development including lesson plans, written exercises, demonstrations, experiments, discussions, simulation games, computer software, video programs, and teacher's guides.

B. Teacher training and curriculum implementation -- provide training sessions for teachers on how to use the curriculum materials and work with school district administrators to make it part of the official curriculum.

C. Targeted presentations designed for specific classes which use household toxics, e.g., art, woodshop, autoshop, photography and horticulture classes.

D. Picture and essay contests.

## BUSINESS COOPERATION PROGRAM

A. Arrange distribution points for brochures through retail outlets which sell household toxics and real estate agencies.

B. Promotion of safe substitutes by retailers--work with district and store managers to promote safe substitutes by stocking more safe substitute products, identifying safe substitutes in the store by signs or labels, and advertising the safe substitutes program.

C. Seek cooperation of retailers and service stations in collecting HHW for recycling, e.g., waste oil, auto batteries, mini-batteries, and advertising service to customers.

D. Seek the cooperation of manufacturers of household toxics in providing better labeling information, particularly on the disposal of hazardous waste.

David Harris, Education Director, Environmental Health Coalition, San Diego, CA

Harris gave his recommendations for a comprehensive education and outreach program.

A. Direct education by direct presentations to community groups. EHC has a video-slideshow which they show to any group of 15 or more people. The presentation emphasizes the dangers of household hazardous wastes and suggests alternative methods of use and disposal.

B. Teacher training, curriculum development

C. Manufacturers/distributors can provide point of purchase information.

D. Mass-media approaches, such as newspapers, radio (Sunday morning programming can be especially good), PSAs, TV.

E. Brochures. EHC printed 200,000 brochures. They were distributed to schools, community groups, people moving out of houses, retailers such as drugstores, nurseries, hardware stores. Note: the retailers were the most receptive.

F. Creative projects. EHC had a local artist create panelsgiving HHW information.

G. Demonstrations. EHC organized a demonstration of HHW and possible problems for trash compacting trucks. Three local papers covered the event.

H. Curriculum. EHC is working with schools and teachers on a program for 4th, 5th and 6th graders. Materials will be flexible for teacher use and consist of two one-hour lessons with a booklet and video tape. Teachers will be trained and will be given credit.

I. Retailer cooperation. In regard to the identification of toxic products EHC is hoping to get help from retail stores in spreading the word about products that are dangerous or safer to use. They hope to take advantage of the competitiveness of stores to further their promotional efforts.

Jack Lord on Curriculum Materials.

Lord's objectives were first, to distinguish between informational materials and curriculum materials and why people should care and second, to show some examples of existing curriculum materials on HHW.

Lord pointed out that most of the materials exhibited in the display for the Education Panel were educational. They were not designed for use in a school by a teacher. A teacher might use them as an informational resource, the way a newspaper or book might be used, but they do not have the structure or features that textbooks do.

This distinction matters because to teach from informational materials requires more knowledge on the part of the teacher and much more preparation time. A lot of the groundwork that the teacher would otherwise have to do is done by the preparers of curriculum materials and incorporated in the publication. If you want to encourage local schools to teach about HHW, it is advisable to seek out materials specifically prepared for schools, because they will be more attractive to teachers.

Curriculum materials can be distinguished from informational materials because they have (and informational materials lack) the following features:

The material contains a statement of objectives: a clear, brief list of what the student is supposed to learn.

The material is organized as lessons or units of study.

The material states the grade level at which it is intended to be used. The broader the range of grades claimed, the less credible.

The materials identify a specific place in the curriculum where they may be used. Is it intended, for example, for junior high school general science? For twelfth grade for home economics? For Problems of Democracy?

The materials provide an estimate of the amount of time required to teach the unit.

## LABELING PANEL

Panelists: Janet Auerbach, Lee Baxter, Jay Feldman, Donald Lofty, Dana Duxbury, moderator.

The labeling panel looked at how consumer products are currently labeled, the laws which govern these products and the adequacy of current labeling provisions.

Lee Baxter, Director, Western Regional Center, U.S. Consumer Product Safety Commission, described the current legislation which governs the labeling of consumer products. The Hazardous Substances Act (HSA) governs all consumer products. A hazardous substance is any substance or mixture of substances which is toxic, corrosive, an irritant, flammable or combustible, a strong sensitizer, generates pressure, is radioactive, or can cause personal injury or illness.

The HSA is only concerned with acute or immediate effects. It does not require that the long term or chronic effects of a substance be taken into account when labeling requirements are developed.

It also does not require ingredients to be listed or that environmentaly sound disposal information for unused products be included.

Janet Auerbach, U.S. EPA, described the provisions of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). This law regulates the manufacture, use and disposal of agricultural and household pesticides. All pesticides must be registered by FIFRA, and they must be classified for either general or restricted use. The law can suspend or cancel the use of a pesticide, and it requires informative and accurate labeling. Auerbach was questioned about the provision which requires home pesticides to have the following disposal information "Wrap in newspaper and put in the rubbish." Since many home pesticides could be later cancelled or suspended, participants pointed out the lack of wisdom in continuing such a practice. If a pesticide is cancelled, homeowners are not reimbursed or required to return unused portions.

Jay Feldman, National Campaign Against Pesticides, described the activities of his organization to educate the public on pesticide issues. They have sought to improve labeling both of farm and home pesticides. They wish inert ingredients to be listed. They are deeply concerned that the re-registration process for all of the pesticides which have been "inadequately" tested is proceeding so slowly.

Donald Lofty of the Drackett Company described how the laws governing labeling are federally based. Industry is opposed to state-by-state labeling. Except for the paint and coating companies, no other trade association is developing voluntary labeling information.

## HOUSEHOLD HAZARDOUS WASTE CONSTITUENTS AND THEIR IMPACT

Panelists: Tim Brown, K.C. Donnelly, William Franklin, Girish Nair, David Galvin, moderator.

The first speaker, Girish Nair, Research Associate at Tufts University, Center for Environmental Management, spoke about a list which the Center prepared on hazardous constituents of household products. The Center put together a list of approximately 400 household products along with the hazardous chemicals present in these products. The main objective in putting together this list was to identify the ingredients of household products which might be of concern if they ended up as contaminants in the landfill leachate on waste water. The Center's list (Appendix VII) was based on an earlier WA Department of Ecology list which was used as a benchmark. Household products had been categorized under seven major types of household products, specifically automotive, household maintenance, paint products, repair and remodelling, hobby, park and recreation, personal care products and pesticides and herbicides. Information about ingredient toxicity, carcinogenicity, and flammability have also been included along side each product, wherever data was available. The list was not considered to be exhaustive but in fact was an ongoing process with products being added or removed. Other similar lists have been prepared as part of a waste characterization study by the Stanford Research Institute and the Triangle J. Council of Government, North Carolina. The list was further explained in the discussion which followed the talk. Suggestions were made to make the list more detailed and exhaustive.

After Mr. Nair, Professor K.C. Donnelly, Laboratory Director of the Department of Soil and Crop Sciences, Texas A&M University spoke about a review which his department had carried out on the occurrence and concentration of organic chemicals on municipal and industrial waste landfill leachate. The study was undertaken to complete chemical constituent and concentration data and to evaluate the risks associated with exposure to the organic contaminants present in the leachate. Toxic and carcinogenic chemicals were found in the leachate from all 58 landfills for which data was available. Different groups of pollutants are found in different landfills. The concentrations and toxicity of some municipal waste leachates may cause a cancer risk equivalent to those from industrial waste landfills. Estimated carcinogenic potency for some municipal landfill leachates were comparable to the carcinogenic potency for the leachate from the Love Canal Landfill. The discussion which followed the talk touched upon the effect of leachate dilution on carcinogenic risk. It was also pointed out that inorganic chemicals and natural carcinogens were not included in the risk evaluation study. Natural carcinogens are reported to be present in many everyday foodstuffs and vegetables. Variation in leachate concentration with landfill age was also discussed.

The next speaker, William Franklin of Franklin Associates, Ltd., an engineering/environmental/management consulting firm, spoke on contaminants present in resource recovery plants. Hazardous materials which turn up in the municipal solid waste incinerators come mainly from SQGs, household waste trash pickup, which includes HHW collection programs, and trace contents of so-called "safe materials" like inks in paper. The main issues with regard to incineration include evaluation of the impact of hazardous materials from the above sources, rejection of possible corrosives and HHW from the incinerator feed, removal of heavy metals by battery recycling, determining sources of contaminants and eliminating them to reduce contamination, proper monitoring of incinerators and ash disposal. Long term solutions to these issues should be looked into. Franklin Associates is presently engaged in a novel EPA-funded study of characterizing and quantifying the sources of lead and cadmium in the incinerator ash. An EPA Office of Research & Development (ORD) study into determining total metal content of ash, health and risk studies, flue gas clean-up is also underway. Operator certification, efficient combustion and proper handling and storage of hazardous materials were other important side issues. The discussion which followed covered possible lead sources including car batteries, lead pipes, Christmas decorations, paints and pigments, ash contaminants and disposal, formation of hazardous materials during incineration, and relative concentrations of dioxins in the incoming and outgoing streams.

The last speaker, Tim Brown, Public Education Department, Water Pollution Control Federation, spoke on the impact of HHW on wastewater treatment facilities. The wastewater treatment process was briefly explained. Priority pollutants in household waste water are mainly cleaning products like toilet bowl cleaners, septic tank cleaners and cosmetics (such as makeup, perfumes, shampoo etc.). Studies on wastewater treatment and the percentage of HHW in wastewater streams were reviewed. An EPA domestic sewage study was quoted as reporting 19.4 percent of heavy metal and 7.5 percent of organic loadings ending up in publicly owned treatment works (POTWs). A Seattle Metro Water Quality study stated that residential sources contributed 7 to 11 percent of the heavy metals and 55 to 64 percent of the extractable organics. Phthalates were the main constituents of the organic contaminants. A sizeable percentage of mercury and arsenic discharged to the two plants were from residential sources. Most of these hazardous wastes cause serious problems at wastewater plants because they are not designed to remove these wastes. Some of the heavy metals do end up in the sludge. The granulated activated carbon system is used to extract organics. However, this does not remove all the organics, and therefore some of these end up in the sludge.

To address these problems the Fairfax County (VA) Department of Public Works and the Palo Alto (CA) Water Quality Control Division have sponsored collection programs.

The Water Pollution Control Federation (WPCF) regards public education on HHW and the establishment of regular HHW collection programs as possible solutions to the problem.

## INSTITUTIONALIZING THE PROGRAM

Lise Anderson, Toxics Education Specialist, Ecology Center of Ann Arbor, Michigan.

The first part of Anderson's speech dealt with what is meant by a "program" as opposed to a "collection." The second part of her talk dealt in the Ecology Center's state-wide education project, a part of which is focused on helping counties institutionalize what have mostly been single event collections. Anderson expressed the hope that her comments would be beneficial to states which are trying to begin or to continue programs.

A "collection" is distinguished from a "program" because developing a program takes more effort and has a far greater impact. Most groups start with a pilot collection that has an educational component. Follow-up towards institutionalizing the collection needs to be planned way up front. Some of these steps include:

- setting long and short-term waste reduction and collection goals
- identifying target groups for educational programs
- setting achievable educational objectives
- working out a relationship with a contractor
- being sure when developing educational programs that specific groups are targeted

    a) schools -- education for teachers or students?
    b) local decision-makers -- how should they be educated?
    c) media -- improve their knowledge of a topic about which they know very little

- setting funding goals and investgate all possible options for funding.

There are several key characteristics of an institutionalized HHW management program to aspire to:

1. Regular collections
2. Permanent collection sites
3. Secure program funding based on a number of formulas such as:

    - level of participation in collections
    - population served
    - tonnage kept out of waste stream.

4. HHW included in solid waste planning

This is where MI is behind CA and WA. In both of those states they have developed solid waste language which includes HHW. Anderson spoke about what MI lacks and why and how the Ecology Center and the State-Wide Coalition are working together to address this problem.

In 1987 communities throughout MI are commencing the five-year update of the county solid waste management plan. This is a new phase in implementation of the 1978 Solid Waste Management Act.

So-called P.A. 641 mandated a 20-year plan to "assure that all non-hazardous solid waste generated in a planning area is collected, recovered, processed and disposed of at facilities that comply with state laws and rules."

While the first round of planning five years ago took only a superficial look at the problem and the methods to controlling it, the update promises to be a planning revolution. Why the new interest in solid waste management? First, in general, MI citizens are more aware of the limited space available for storing solid waste. Second, contamination from solid waste landfilling is a recognized problem in the state.

However, the biggest difference showing up on planning efforts between five years ago and today, in MI, is the sudden belief in recycling and resource recovery on the part of public works administrators at all levels.

Will this new commitment to planning and innovative waste management reduce the amount of HHW flowing into regulated landfills and water treatment systems in the state? Anderson thinks not.

The foci of the Solid Waste Program of the Department of Natural Resources (DNR), the key agency in this, since 1978 (but especially in 1987 with the five year update) are resource recovery, waste reduction, composting, incineration with and without energy recovery and landfilling. HHW is not mentioned in either the Act, the regulations or the brochures describing the law's intent or the DNR's related programs. The issue of HHW is not required for inclusion in local planning.

One related DNR program, the Clean Michigan Fund (CMF) was established by the legislature in 1985 to fund solid waste related feasibility studies, pilot projects and capital expenditures. CMF also funds the HHW collection and education project but it is not DNR and Solid Waste that implement those programs, it is hazardous waste program. Recent experience indicates that these 2 apparently do not talk to each other.

The CMF program does not have the long term planning orientation of Act 641. What results is that HHW collections in MI are sporadically organized. Most local communities get frustrated because of the lack of state support for planning. This oversight negatively affects just what the state wants most, which is that local initiatives and local responsibility happen for all solid waste management.

In MI, hazardous substance planning does not occur locally except in two counties. What happens in all of this is that there are two different groups talking about two interrelated problems and solutions. The environment comes out the loser, because HHW continues to flow into and out of the states landfills and numerous illegal garbage dumps.

Anderson interviewed a number of people at the state and local level and some regional agencies who are involved with the "641 planning update". Her purpose was to learn how HHW is being addressed in this new planning phase. She had assumed that HHW had some priority in the state's solid waste management program, but found that it did not.

In March 1986, the Ecology Center received a C.S. Mott Foundation grant to continue its work on HHW education which had included the publication of a handbook on household hazardous substances. The goals of the grant project were 1) to reach out to teachers and assist them teach more about household hazardous substances 2) to promote a uniform set of guidelines for resource people who respond to calls and are involved with local planning in MI.

This year in Anderson's grant renewal request we targeted three counties to assist with education and planning. Anderson chose those three to work with because each had demonstrated an interest in HHW management. The Cooperative Extension offices in two of the three had identified HHW as a "critical objective" to address this year. One had received a grant from the Clean Michigan Fund (CMF) to organize its first collection day. The other had just completed a self-funded, very successful 3 county collection with assistance from Dow Chemical. The third county, Washtenaw County, was, for convenience, the one in which Anderson lives. The county has both a dynamic Director of Public Works and the 2,000 member Ecology Center. Because of these two factors there is genuine interest in establishing an integrated solid waste management plan. Washtenaw County also hosted three HHW collections in the past three years. Anderson submitted a program plan to each of the counties for a HHW management leadership program. The focus was to develop a constituency locally for ongoing management to get officials involved in the issue for the long haul. Having presented the program idea they developed their own version. They got local officials, fire fighters, water treatment specialists, and county commissioners to come to the sessions.

The first step in assisting these counties was to identify who else, beside collection organizers, was involved in solid and hazardous waste management, water and sewage treatment, who held the purse strings and who the local environmental activists were. The purpose was to do what Anderson called "developing a constituency" for ongoing local HHW management and to get officials and activists committed for the long haul.

First they presented a leadership training proposal to the lead agency the Cooperative Extension Service. The results of these leadership training sessions were 1) that the County Cooperative Extension felt support for local elected officals to look further into program possibilities. 2) subgroups were formed that could help county staff as they developed the "program" 3) key people would support HHW management when it came up for a vote at the Commissioners meeting. Through meetings with local leaders Andersson was able to get into the schools to plan teacher inservice training. Finally as some attendees were on 641 Planning Committees, she was able to reach the local Act 641 Solid Waste planning committee in these two counties in time for them to raise the HHW issue in their "update."

In addition to working along with these three counties, the Ecology Center works closely with a statewide coalition called the Home Chemical Awareness Coalition which includes the Cooperative Extension, Dow, and the Michigan Environmental Health Association of Counties. There is an annual seminar for recipients of Clean Michigan Fund money to organize collections, and they are currently surveying all those who have had collections in the past two years in hopes to establish whether or not counties are moving beyond single event collections to comprehensive programs. Their results will be submitted to the governor to regain support for collection and planning.

In conclusion in Michigan, local areas are addressing HHW separately from solid waste management in most cases. HHW activities will continue. But no mandate is there to back them up. An important aim should be to get involved in the solid waste planning to ensure that it is a comprehensive program. The Home Chemcial Awareness Coalition will serve as an ongoing resource and group who can handle technical assistance. The Ecology Center, with its staff of 24, newly motivated and informed, will be reaching as many of the 641 committees as it can with advice on HHW. In MI they can boast only one such institutionalized program so far. It takes either a documented environmental problem or dedicated local leaders to institutionalize a program.

## HOUSEHOLD HAZARDOUS COLLECTION SPONSORS

Leslie Lewis, Citizens Participation Coordinator, Connecticut Department of Environmental Protection, Hartford, CT.

When it comes to sponsoring a HHW collection program, no one entity is the "best." For each individual town, county, or state, there will be a number of possibilities.

Who has sponsored collections around the country so far? First a look at industry. As was reported earlier, Dow Chemical has held collections at their Midland, MI and Baton Rouge, LA facilities. Hercules Incorporated did the same in DE. Monsanto and Browning-Ferris Industries have also had involvement in this area. Sometimes firms which specialize in hazardous waste disposal offer their services free of charge to the community in which they are located. Clean Harbors, Inc. and GSX have used this approach. In particular, communities where these companies' facilities are located are the beneficiaries of these community relations programs. Other corporations, such as Union Carbide and Stauffer Chemical have provided educational materials. In CT Stauffer Chemical designed and did mechanicals for the state's brochures and the CT Business and Industries Association and the CT Petroleum Council paid for publication of 100,000 brochures. It was a very good thing for Lewis's department since they had no money for them. Finally, in CT two firms which were charged with violating the state's hazardous waste regulations donated money for HHW collections in lieu of paying fines -- a different approach to gaining sponsorship.

The Environmental Protection Agency has made some funding available to states through the regional grant program. This money has in turn gone to help establish collections at the local level. Minnesota is one state which chose this method of sponsorship. A lot of those monies are drying up, but even if five requests are turned down, the sixth may be funded.

Several states have elected to undertake collection programs. Florida, has had the biggest program which covered every county. The Amnesty Days project involved a series of county wide collections designed to service households, farms, institutions, and some small businesses. The state took care of everything: publicity, hiring the contractor, collection costs, etc. Rhode Island has a similar regional program. Minnesota very actively co-sponsors and administers the program along with the community. Other states, including IA, KS, NY, and AL have sponsored pilot collection days. In CT, the state has money but does not think of itself as a co-sponsor, because the towns do the majority of the planning. Depending on how "sponsorship" is defined, there are a number of states which have matching grant programs and get involved in that way.

County governments get involved. That is something that people in the West and Midwest have as a great luxury-a strong county government system. In CT each one of the 169 towns believes that it is a sovereign entity and no regional group is going to tell them what they have to do. Having a county government system set up to handle collection programs regionally is a real benefit. States such as CO, CA, MI, WA, and MD have done programs on a county wide basis. Cooperative Extension Services, Conservation Districts, county or regional planning agencies have all lent their expertise to these events. A more ambitious approach has been undertaken in San Bernardino County, CA, where a series of permanent transfer facilities has been established. The county health department administers the program, whch is funded through a surcharge on each ton of garbage disposed in the county.

Town - by - town is yet another approach. In CT towns with as few as 14,000 people are trying to do these collections by themselves. It means that there is a much smaller pool of people to draw from, but in MA and CT and other states collections have been done town - by - town or a group of towns through local initiatives.

On a county or town basis the following local agencies have sponsored events:

- County/local health departments

  They have a vested interest in seeing that HHW is out of the home environment as well as the greater environment.

- Fire Departments

  Connecticut has had outstanding support from them. This is especially true with fire departments which have active "HAZ-MAT" (hazardous materials) teams. Not only have they been helpful with site layout and safety, but if a situation arises where the contractor will not handle certain materials, the fire department staff have had the training and technical expertise and can help out.

- Town Planners

- Public Works/Sanitation Departments

  They get involved with wastewater treatment through solid waste management. Frequently CT uses town garages as collection sites and being able to work through the Public Works Department makes things very easy.

- Solid Waste/Waste Water Managers

  They have an interest in making sure that their particular entity runs properly. Diverting HHW from the waste stream makes their jobs easier.

- Cooperative Extension Services/Soil Conservation Services

  Cooperative Extension does a great deal of education on products in the home. They have been very helpful. The Soil Conservation Service have been helpful with groups that are near or involved with small farms.

- Regional Planning Agencies

  These may not exist in all states, but in CT they have acted in lieu of a county government planning system in many cases. In CT and MA as well, they have put together several very successful multi-town events.

- Conservation Commissions

  In CT every town has such a commission to deal with their open space planning and other more technical environmental projects. For greater community visibility many commissions have latched on to the HHW collection programs. This has proven to be effective, and has frequently helped to revitalize a somewhat dormant conservation commission.

- Civil Preparedness Offices/Emergency Response Coordinators

  With the passage of the SARA amendments they are becoming more involved in local hazardous waste issues anyway so that they find that the HHW collections fit in nicely.

Other possibilities exist. Be creative.

It is important that the state, county, or local government body which sponsors the HHW collection have a strong commitment to the program. This gives the initiative credibility. In many cases the agency has professional staff which can stay on top of planning and implementing the collection.

Sponsorship may also come from private entities. No matter who is the primary sponsor of a HHW event, secondary sponsors can be very helpful as well. In CT they have had extremely good cooperation from their local water companies. They see these projects as vital to the protection of their well-heads, their groundwater wells and resources. In fact, when CT needed to have more brochures reprinted, a local water company volunteered to reprint as many as were needed, because they saw it as a very important public education project and they wanted to be involved.

The League of Women Voters is indispensable. On the local, state, and national level they are an absolutely essential entity to have involve in these programs. They can apply pressure to public officials better than any other group. If there are concerns about gaining the support of local officials, contract the local League. There is generally a quick turnaround once the League is involved.

Environmental and public service organizations have actively supported HHW programs in a variety of ways. In CT local chapters of the Sierra Club and the Audubon Society helped to publicize collection days. People feel the issue of HHW very immediately, in their own homes and communities. Environmental groups often have difficultly getting across "big picture" issues, but collection programs, which are close to home, give environmental groups a chance to gain grassroots support. Civic groups like the Lions and the Rotary have provided traffic control. They can do a very effective job of spreading the word. Neighborhood associations provide links to the different communities in large cities. Hospitals have manned hotlines and offered their assistance in disposing of waste pharmaceutical products. In Seattle, the YMCA was actively involved with promoting the "mega-collection" which serviced over 4,000 households in one day.

There are obviously pros and cons associated with multiple sponsorship of HHW projects. On the one hand, a variety of organizations means a large potential workforce with expertise in many areas. However, unless tasks are specifically assigned to each group, there is the danger of a "too many cooks" situation arising. It should be very well-defined which is the lead agency and which other groups are to be involved and in which roles.

In Manchester, CT, a fairly large town, five members of conservation commission planned an event on their own. They had 35 participants. On the other hand, in Stamford, CT, a large city, the Sanitation Department, the water companies, the fire department, conservationists and the Stamford Jr. Women's Club, the League of Women Voters were all involved. Their first ever collection brought out over 550 families. It was really too many, but it was a great participation rate. In the Litchfield Hill District, composed of seven towns, a company, selectmen, garden clubs, conservation commissions, League of Women Voters, all were involved. Over 450 families came into the collection event.

No matter who sponsors a HHW collection there should be a definite commitment from a county, municipal or state agency to give credibility to the program. (A lesson CT learned from their recycling program.)

If you only rely on volunteers, Volunteer burnout over the years can occur. It is important to have professional staff.

Use everybody you can. Knock on doors. Be creative. Everyone can be tied into HHW programs.

## SITE SELECTION

Darrell Cullen, Manager, Technical Services Division (Western Region), Chemical Waste Management, Fremont, CA.

The technical services division specializes in laboratory clean-outs as well as managing hazardous waste collection programs. In 1987 Cullen's group will manage over 20 programs in CA.

Two key objectives of his talk were to:

- o Stress the crucial importance of proper site selection in the planning process. Poor site selection is the quickest way to diminish the chance for a successful program.
- o Provide a checklist of criteria for site selection.

In addition to site selection, another important consideration is site design. First Cullen addressed site selection.

Involve your contractor early in the planning process. Be sure the site sill accommodate your anticipated participation without a traffic flow problem. Keep in mind that the site design is a factor in determining the site selection.

SPECIFIC CONSIDERATIONS FOR SITE SELECTION:

- o Accessibility -- is it isolated, or easy to find?
- o Well-known location -- will people know the site, if county fairgounds, high school football parking lot.
- o Low-volume traffic -- will children be playing nearby or will there be lots fo people?

  Cullen is not in favor of collection programs in shopping malls where there are large numbers of people and cars.
- o Security -- An overwhelming response may require a second shift, after dark, or even over into the next day, so security for overnight supervision of materials, a locked fence or even better a security guard may be necessary.

- Facilities -- for example, lights, when programs are held in fall work may be done after sunset; - Water, for hazardous categorizing (haz-cating) for drinking purposes; bathrooms.

- Impervious Ground

  Cement or black top are best. Gravel or dirt not recommended. Most locations will be covered with plastic to collect spills. It is very difficult to work on such a surface if it is over gravel or dirt.

- Sewers or Drains - Barriers can be used to cover them if a location is otherwise ideal but it is a consideration that has to be kept in mind. Big trouble will ensue if spills get into ground-water.

- Communication lines -- phones for emergencies, or to request extra equipment to make program run smoothly

- Shelter -- contractors can provide a tent however some locations can have permanent structures in the event of inclement weather.

## SITE DESIGN

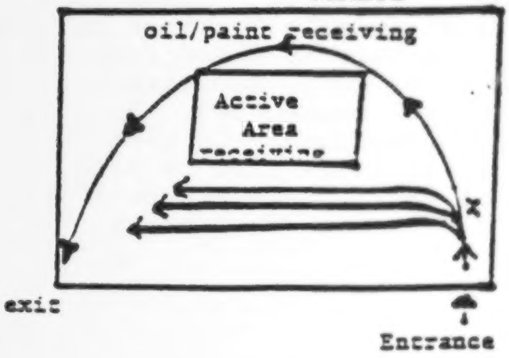
With design in mind, contractors can help collection organizers to select the best site for their collection program.

Site design is tied into Traffic Control and the receiving end for HHW. A "drive-through" style program has two goals which are to get cars through as quickly and as safely as possible. Normally, a group of receiving lines are setup. two to three (possibly four lines) in a program which collects 30 to 40 drums of waste.

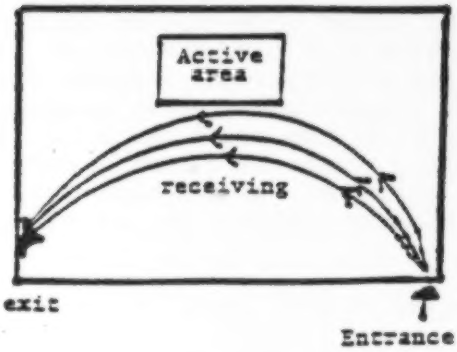
Provisions should be made for overflow parking. With a lot of used oil coming in, many participants want to keep the emptied ontainers. Overflow parking is helpful when people need to have a place to wait while the oil is consolidated. Also, the neighborhood "good samaritan" brings in waste in his truck for himself and his neighbors. Unloading those materials is more time-consuming than it is for a person adhering to the five gallon, 50 lb. limit. Space needs to be set aside for such participants to pull over. Oil or Paint Express Line can be set up since 40 to 50 percent of waste received by Chemical Waste Management has been used motor oil or paint.

Screening can be done by less technically qualified people. Referring to the following diagram Cullen described the two design models, the "Island Set-up" and the "Horseshoe Set-up."

Example 1: Island Set up Method



Example 2: Horseshoe Set up Method



The pinch point is where cars divide into the different receiving lanes. Questionnaires and surveys are passed out before this point while cars wait in line. The traffic control staffs can collect these handouts from people while directing the participant to an available receiving lane.

Of the two methods the "island" set-up works for the express line approach. It is in this way that it differs from the horseshoe set-up. Successful participation should not have to mean 1 1/2 to 2 hour waits.

In concluding, Cullen reiterated his view that early planning for the site location and design is a very important joint task for organizers, technical people and contrators.

# HEALTH AND SAFETY

Larry Sweetser, Environmental Compliance Program Manager,
Sanitary Fill Co., San Francisco, CA

The presentation identified the key components to address in planning the actual waste handling operation for the most common type of collection project, a drop-off site. The topics presented allow communities holding first-time collections to benefit from the experiences of those who have held programs, and to learn proper procedures for handling HHW. Successful projects depend upon being prepared for the unexpected. By learning from the experience of others communities can have contingency plans in place. Even so it is impossible to plan for all problems, especially because of the intense nature of a collection day, which is, in effect, a marathon lab-packing event.

## PREPLANNING

Preplanning: the key to a successful and safe project. Assembling a team and doing the planning needs to be done well in advance of the project.

A. General Considerations
  1 Identify the generator
  2. Identify the project coordinator
  3. Assemble project team (sponsors, management, hauler)to develop project
  4. Contact disposal site to insure ability to accept all collected wastes
  5. Determine if any recycling is going to occur: this can can greatly effect the flow of waste and safety issues at the site.

B. Permitting Considerations
  1. Approval by all relevant state and local agencies
  2. Adherence to operation plan
  3. Design flexibility into the plan to adjust to situations that arise during the collection day.

C. Public Education/Notification Considerations
  1. Stress safe packaging and transport requirements
  2. Indicate wastes accepted and excluded from the project. (Expect excluded wastes to come in anyhow. Consider what you will do in those cases.)
  3. Provide instructions for participants prior to arrival at the site
  4. Give a telephone number for additional information

D. Site Location Considerations
   1. Accessiblity/familiarity to target area participants
   2. Access from main roads
   3. Nonobstruction with existing traffic flows
   4. Considerations for traffic at the site
      a. excess traffic handling
      b. worker parking
      c. entrance area and egress
      d. waste receiving lanes
   5. Available resources
      a. impervious surface
      b. storm drains, wells, streams
      c. communications--telephone, radio
      d. sanitary/ decontamination facilities
      e. shelter for inclement weather
      f. power supplies
      g. lighting
   6. Insurance

E. Site Personnel Considerations. Many people will be needed. Specific jobs must be assigned.
   1. Volunteer vs. hired staff
   2. Identification of personnel in authority
   3. Numbers of workers
   4. Qualifications
   5. Responsibilities
   6. Training
   7. Information packet

F. Equipment Considerations
   1. Checklist of equipment (from drums to pencils)
   2. Contingency plan for getting forgotten or additionalsupplies, especially since many projects are on weekends.
   3. Identify sources
   4. Arrange for arrival at the site

G. Waste Handling Considerations
   1. Flow of waste on the site
   2. Excluded waste contingencies
   3. Non-resident participation
   4. Acceptance of waste from businesses or non-profit groups
   5. Disposal of non-hazardous waste
   6. Establish recycling procedure, if applicable

H. Emergency Response Procedures
   1. Pre-notification of local agencies
   2. Established procedures
   3. Designation of on-scene coordinator
   4. Training of site personnel
   5. On-site assistance vs. on call:
      Health Department, haz-mat vehicle, police, fire, bomb squad etc.

I. General Health and Safety Issues
    1.Personal protection
        a. availability
        b. required items (protective glasses, etc)
        c. enforcement
    2. Relief area -- for breaks, lunchs

J. Post Project
    1. Site Cleanup
    2. Excess material removal
    3. Extended waste storage contingency
    4. Project review with coordinators

THE COLLECTION DAY -- On-site Waste Handling Operations

A. General Setup
    1. Arrival of personnel
    2. Final instructions to personnel
    3. Restricted areas
    4. Media area
    5. Traffic flow -- directions to and on-site (signs, cones
    6. Opening time. Be prepared for early arrivals. Do not begin the event with a backup of cars.

B. Entrance Area
    1. Well-identified -- signs, balloons
    2. Personnel -- police officer or other designated person to control traffic as it enters the site
    3. Waste pre-screening
    4. Distribution of literature/questionnaires/surveys
    5. Participant verification (resident, business, etc. )

C. Receiving Area
    1. Traffic flow
    2. Personnel
        a. responsibilities
        b. qualifications

D. Sorting Area
    1. Identification of waste into hazard classification(be sure to ask homeowners for information before they leave the site)
    2. Personnel
        a. responsibilities
        b. qualifications
        c. authority

E. Packaging Area
    1. Verification of waste classification
    2. Personnel
    3. Liability

F. Waste Loading Area
    1. Non-interference with traffic
    2. Close to packaging area

G. Vehicle Exit
    1. Coordinators
    2. Traffic Flow

H. Special Waste Area
    1. Haz-cat -- identification of unknowns
    2. Paint consolidation
    3. Waste oil
    4. Designated site for dangerous waste dioxin, explosives, pentachlorophenol (The latter is still sold; yet, no waste site in the country will accept it.)

I. Equipment Storage
    1. Accessible
    2. Non-obstructive

Post Project

A. Finalization of recordkeeping -- manifest, variances
B. Critique by key personnel and sponsors
C. Identification of preventative measures
D. Determination of future plans
E. Notes of appreciation to involved parties and personnel

Sweetser made some additional comments. Be prepared for large quantities of paint. A separate area to handle it may be appropriate. Even though a product may have the same label it is possible that the formulations may vary from year to year. This should be checked before bulking to prevent mixing of incompatibles.

Not all wastes will be hazardous. A garbage truck or dumpster should be on-site for these wastes. A few days after the event check the area near the collection site. People who could not come on the collection day may have left wastes near the site.

Also, this is often the first exposure the public will have to the issue. It is important to do a proper job. If a community is not prepared to commit resources to the project it may not be advisable to have one. To raise the awareness of the citizens without a properly managed, adequately funded and staffed solution is not a good idea. It is often the case that participation is not what was anticipated. In cases where participation is greater than expected it may be necessary to close early. These are potential problems to have in mind. Be prepared.

Final note: Sanitary Fill Company has institutionalized its program with a permanent HHW facility for the residents of San Francisco, (opening date: 1/88) making it the city's first and only such facility to date.

# CONTRACTOR SELECTION

LeeAnn Merashoff, Regional Sales Manager, Northeast Solvents, North Andover, MA

Northeast Solvents has been involved in a large number of collection programs. Merashoff outlined the concerns that frequently come up as communities work to provide HHW collection opportunities for their citizens. Before going into the details related to RFPs, she stressed that there is more to the relationship between a sponsor and contractor than can be indicated in an RFP, particularly since purchasing departments or bookkeeping offices may dictate the wording of the RFP. Her strong recommendation was that a personal meeting take place between the contractor and the entity planning the collection project.

Either in the interview or in the RFP, sponsors must tell the contractor what they want the contractor to do, in specific terms. The contractor will expect the sponsor/community to be responsible for certain aspects of the collection project. It is important that these conditions be discussed in advance and that sponsors follow through on their commitments. An RFP may not reflect every aspect of the contractor/sponsor relationship. Situations that arise on a collection day will call for flexibility and cooperation between the contractor and the community. Those same qualities shown in the planning stages should indicate what a sponsor might expect on the actual collection day.

## Specifics: Who Will Do What?

- Who will get the temporary EPA ID# for the site
- Who will be the generator?
  From liability point of view, it may not matter who the generator is. From the set-up point of view it will matter a great deal to the contractor. If the contractor is to be the generator then they may prefer to handle all the wastes and not involve volunteers.
- Who will handle the wastes?
- What will volunteers be expected to do and to provide?
- Is the contractor willing to do a dry-run?
  This is a very important thing to do, especially for a large-scale collection event.
- How will the contractor run the site?
  The RFP is useful for spelling this out. It should address:
    a. What kind of personnel will be on-site?
    b. How many technical vs. non-technical people will be handling the wastes?

  - c. Who will make decisions about what wastes to accept and what not to accept at the site?
  - d. Who will be the contact person from the sponsoring organization to work with the contractor? It is difficult for the contractor to be sure that information will come together if they are dealing with three to four different people. One contact person is recommended.
  - e. What kind of health and safety plan is proposed? For example, if wastes are to be bulked, specific health and safety procedures needed to be implemented. When out in the public, as at a collection event, the concerns for proper precautions are magnified.

- What kind of insurance?
  If the community, the legal department, or purchasing office requires a particular type of insurance include that in the RFP.
- What kind of contract?
  - a. An early review of a sample contract may help eliminate contractors with contracts which are unsatisfactory to a legal department or putchasing department.
  - b. Have the legal department review it as soon as possible to avoid the possibility that lawyers for each party will be going back and forth at the last minute, after all the advertising has begun and the site has been selected.
- What to do about the need for clarification?
  Whether it is concerning insurance or the contract do not hesitate to contact the contractor at any time.
- What types of insurance to look for?
  - a. Two types: transportation or fleet coverage insurance and environmental impairment insurance.
  - b. Co-insured? Does your community require that you become an additional insured? Clarify that point in the beginning and include it in the RFP.
- What about indemnification?
  This is an especially important part of the contract to read if there is no legal department. Who is indemnifying whom?
- Are there exclusions in the contract not covered in the RFP?
  Review the two documents to see if they agree or cover different areas.

- How can prices given by different contractors be compared?
  Purchasing agents will ask for prices for an HHW collection day. They are likely to receive estimates which cannot be compared for a lot of different reasons. If a comparison must be made, specific types of pricing will have to be requested.

Two possibilities:

Request for a set-up fee plus a per drum cost.
Request for an inclusive per drum price (which does not give a breakdown of how the contractor arrives at that price).
Different sized communities may benefit from different types of price structures. Different types of wastes may call for different prices.

- How will the wastes be packaged?
  Will wastes be lab-packed?
  Will certain items be bulked?
  Merashoff developed an attachment to their proposals describing the different types of waste packaging and a rough estimate of the average number of drums of certain types of wastes that can be expected.

- What will the ultimate disposal be for different types of waste?
  Review options. One type of disposal may not be the best Solution for the wide variety of wastes that come in a collection day.

- Where will the waste go immediately after the collection day?
  Does the contractor have a local TSD facility?
  Will the waste have to be staged somewhere?

- How long will the waste be in the contractor's facility? It is possible for wastes to be held in a facility for years. As a sponsor you may wish to know what the particular contractor plans to do with the wastes.

- Will the contractor provide follow-up information on the types of waste collected?

In summary, keep the contractor informed. Northeast Solvents has had the experience of having the times for a collection event changed without having been told. The budget will be affected by last minute changes, so keep in contact with the contractor. Find someone you can work with, and work with them on an individual basis.

# FUNDING MECHANISMS FOR HHW COLLECTION PROGRAMS

Dana Duxbury, Senior Environmental Research Analyst, Center for Environmental Management, Tufts University

Throughout the conference various approaches to funding programs were mentioned which were almost as varied as the types of sites, sponsors, and so forth for HHW collections. By pulling these options together the hope is that they can be shared by all.

Funds from the federal government have come mainly through using RCRA 8001 grant monies. These funds are no longer available. Pointing out that persistence pays off, Duxbury recommended "harrassing" the respective regional offices of EPA. To date, there has been no funding from the federal level, but the ten regional offices, in particular their RCRA offices, are going to have funds for solid and hazardous waste. The funds, totaling $3 million, are going to be distributed to the states. There may be an opportunity to develop a link between waste minimization (for which these funds are designated) and the amount of waste your collection program will prevent from going to the local landfill.

State funding has been the next major source of funding, and most probably the largest single source. Florida put $2.5 million into the collection programs they sponsored. The collection programs were done on a county-wide basis. Wastes from Florida's 67 counties were collected over a two and one half year period.

Matching funds both by states and the EPA (which was the case in New Jersey, where the matching funds were applied to 10 county programs).

These funds have evolved been through a variety of means. The major one has been legislative appropriation. Refer to Exhibit 3A. For example, in MA there is no state law to fund HHW collection programs. There is, however, a state legislative appropriation for the matching grant program. Approximately half of the programs in MA have had state matching grant money. The other sources from the states have been state superfunds. Kansas and NH are states in which this has been the case. In CA recent legislation has created a solid waste superfund. Money is not yet available, but it may be possible to get support for HHW collections from a solid waste superfund when it becomes available.

Regional funding is another source. At the county level, from regional planning agencies and from cooperative extension offices (particularly for pesticide collections) money has come directly out of their budgets.

Local level funding comes often from the public works department(the solid waste people), the wastewater treatment officials or the public health officials. There is tremendous variation from region to region, state to state, as to which of those entities is the leading force or the budgetary source of support. Although many local communities receive state monies, there are many others who get involved because they see the HHW collection programs as a way to reduce their liability, reduce leachate problems, reduce wastewater contamination and the problems of illegal disposal. As with other environmental problems, spending money to prevent problems is far cheaper and more effective than clean-up, as has been shown by the Superfund experience.

Corporate support by generators of hazardous waste as well as companies that are in the handling, transportation, disposal, and treatment business have helped to pay for HHW collections. A number of "side mechanisms" have developed particularly in the corporate funding area. There are instances where local businesses, not just those in the waste generating or handling business, have been asked to "buy a barrel" and pay for the cost of one drum of waste from a collection effort. This gives additional support, information and participation. Also, contributions in-kind -- whether they are donations of personnel, or the cost of designing and printing information are another form of support. A local firm may not be able to be the sole source of funding, but can provide useful support. Sponsors should not hesitate to ask. The support of such businesses may make a big difference for the educational component of a program by making it more attractive and more extensive.

Support from individuals is another possibility. At a recent Massachusetts program, participants were asked to give $5. Early assessments seem to indicate that this did not have an adverse impact on the participation rate. It is clear that this amount comes nowhere close to covering the cost of collecting and managing the wastes, but it is an additional funding mechanism.

Fines have been another source of HHW collection program funds. In Utah, where minor environmental impairments, minor violations have occurred, the company which caused the problem has been asked to provide funds for a collection program. In MA and CT there was a similar situation. Speaking with the attorney general or the state environmental enforcement officials might be a good way of finding out if this is a potential funding source for a community.

Taxes and the possibility of an excise tax on hazardous products (covered at the end of Tuesday's plenary session) are another avenue to pursue. Iowa has affixed a retail sales fee in a recent piece of legislation where the retailer will pay a certain amount based on sales. There is some discussion about which products will be included. However, it is an example of another approach to finding revenues to support collection efforts.

Institutionalization of the funding, to have it become an accepted line-item in a budget, is a goal that those who support these efforts would like to see help to regularize and guarantee collection programs.

## OVERVIEW OF THE COSTS OF COLLECTION PROGRAMS

Gina Purin, Golden Empire Health Planning Center, Sacramento, CA

When it comes to predictions of cost for an HHW collection program it is very frustrating because there is no guarantee of what it will cost. A program can cost anywhere from $20,000 to $100,000 or more. Only by doing a program can a community find out what the actual cost is. Since there is no absolute way to predict cost, sponsoring entities must make contingency plans.

How to determine cost when there is no guarantee? There are ways to make cost projections. The factors affecting cost can be explored. What does it mean? Are these programs prohibitively costly as some say or are they not? It all depends on how it is viewed.

When Emy Meiorin of ABAG (see Tuesday, November 3 Overview of Collection Programs, "Regional") did the programs in the San Francisco Bay area, she devised a formula for projecting costs. In order to see how well it worked Purin tried it for one of the collection programs in her area Sacramento, CA and it came pretty close to what actually happened. Richard Conlin, in the Seattle/King County May 1987 program (see overview of Collection Programs "One Day, Multiple Sites") was asked to use the formula. There, too, it came out pretty close to what actually happened. The only location in which the formula was not close to predicting the cost was Berkeley, CA. In a very environmentally aware community rates of participation can be expected to be higher and this should be taken into account when trying to calculate potential costs.

### THE FORMULA TO PROJECT COSTS

1. Figure out the number of households in your community.

2. Multiply that number by .5 to 1 percent to find out how many households might participate. Use a higher percentage for a small community or an environmentally conscious one and a lower percentage for a large urban community.

3. Take the answer you received by multiplying the number of households times the percentage rate you chose and divide it by about three or four because that is the number of households it will generally take to fill a 55 gallon drum of waste. This will give you a drum count.

4. Multiply the number of drums by $250 which is approximately the average cost of disposal. Add a few thousand dollars for set-up and personnel costs and you should be left with a fairly good idea of what your program will cost.

5. To further ensure that you stay within that range you should consolidate the wastes and do what you can to reduce the volume. Through consolidating wastes you will be able to fit many more people's wastes per drum. From three to four households per drum it might increase to six to eight households per drum.

Another less reliable way to project costs is to look at other similar communities to see what their experiences have been. ABAG's formula is a far better tool than this approach.

Another good way to predict costs is to ask the hazardous waste firms which have had experience with programs. If you can develop a really good RFP you should be able to have a good sense of what the costs will be. As LeeAnn Merashoff mentioned earlier (How to set up a HHW collection program "Contractor Selection") costs will vary from one contractor to another. Purin suggests that a really tight RFP which forces bidding contractors to use the same format should help to deal with this problem. Purin referred to a contractor comparison sheet, used in the Sacramento program. Two different contractors responded to the same questions in the same format. It gave an accurate indication of what was being charged and what it was being charged for.

Not as an indicator cost, but more as an indicator of waste generation, are "algorithms" (models) which were devised by the University of Arizona's Garbage Project the same group which did the studies of HHW composition in Masin county, CA and new Orleans, LA. In CA now, under Assembly woman Tanner's process, AB 2948, every county is going to have to look at waste generation in their county. The models are available for those who are concerned with this issue and can help in determining the amount of HHW is going into a landfill, based on socio-economic data, census tract, etc. It will not predict what will come into a collection program or what people are storing however it will give you an idea of what is going into your solid waste landfill. It is also going to provide data relating the exact amounts left in containers. In other words, when considering amounts of waste, they are not including packaging in those amounts.

FACTORS AFFECTING COSTS:

1. Rates charged by a contractor can really vary. (Refer to Exhibits 9 and 9A: "Contractor Comparisons" and "A Look at Pricing and Contractors.")

2. Distance to hazardous waste treatment, storage or disposal facility can impact costs. Distance can affect the way in which costs are calculated for transporting the waste.

3. Waste management options used can also affect costs. Some waste management options are more expensive than others, such as incineration and travelling long distances with the

Exhibit 9

## CONTRACTOR COMPARISON

To demonstrate differences in rates charged by contractors, a hypothetical program situation is created below using actual (i.e. real cost) figures for services provided by two different contractors. This program assumes it is open to the public a total of 6 hours on one day and each staff person works a total of 8 hours.

| SERVICES PROVIDED | CONTRACTOR A | CONTRACTOR B |
|---|---|---|
| Set up costs | $1,100 | $ 250 |
| Personnel (1 chemist, 1 supervisor, 1 leadman, 6 technicians) | 2,520 | 2,456 |
| 2-Ton Truck with Lift Gate | 200 | 200 |
| 40 Foot Flatbed | 720 | 440 |
| 40 Yard Dumpster (2) | 360 | 250 |
| 17-H Dot Drums (176) | 4,048 | 4,400 |
| Disposal: | | |
| Battery Recycling (10 batteries) | 10 | 8 |
| Motor Oil for Recycling (3 drums) | 105 | 60 |
| Bulk Liquid Pesticides for Incin. (2 drums) | 1,100 | 658 |
| Bulk Oil-Based Paint for Incin.* (60 drums) | 27,000 | 19,740 |
| Water-Based Paint for Recycling (30 drums) | 3,000 | 6,750 |
| Lab Pack Organic and Inorganic Acid for Treatment (10 drums) | 5,500 | 3,850 |
| Lab Pack Organic and Inorganic Liquids for Treatment (10 drums) | 5,500 | 3,850 |
| Lab Pack Organic and Inorganic Water Reactives for Treatment (1 drum) | 900 | 249 |
| Lab Pack Other Organic and Inorganic Solids and Liquids for Landfill (60 drums) | 10,500 | 11,400 |
| TOTAL | $62,563 | $54,561 |
| * If oil-based paint was recycled instead of incinerated, cost would change: TOTAL | $41,563<br>($100/drum) | $49,761<br>($249/drum) |

SOURCE: Golden Empire Health Planning Center, P.O. Box 162997, Sacramento, CA 95816.

Exhibit 9A

## CONTRACTOR COMPARISON

To demonstrate differences in rates charged by contractors, a hypothetical program situation is created below using actual (i.e. real cost) figures for services provided by two different contractors. This program assumes it is open to the public a total of 6 hours on one day and each staff person works a total of 8 hours.

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| Disposal: | | |
| Battery Recycling (10 batteries) | 10 | 8 |
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SOURCE: Golden Empire Health Planning Center, P.O. Box 162997, Sacramento, CA 95816.

wastes to have them incinerated in CA. Incineration is more expensive than digging a hole in the ground. In time that will change, but for now unfortunately that is the way it is.

4. The amount collected obviously has an impact on costs. Although the "per unit" cost may be lower when a larger volume of waste is collected, the overall cost will naturally be higher. To reduce costs, programs are now resorting to consolidating as much waste as possible in an attempt to reduce the volume. Bulking paint waste is a typical example.

5. Type of waste collected can add to the expense. Some wastes are simply more costly to dispose of than others.

6. Type of operation can affect costs. A door-to-door pick-up program is more expensive than a drop-off program, for instance.

7. Donations of services/materials can affect costs in a positive way. The more community support you can muster, the less you will have to pay.

8. Amount of money spent on publicity/education will depend on the amount of resources you have. Publicity and education are critical and should not be shortchanged.

There are different ways of viewing costs as a way of determining whether or not these programs are cost-prohibitive. There is a particular scenario in which 289 households participated in a collection program. There were 13,626 pounds of waste generated and the operational expenses amounted to $24,731. Looking at the cost per household for this program it comes to $86 per participating household. The cost per persons served (i.e., those people directly reached by the program through attending educational events, or by being called on the telephone, etc.) the figure drops to $12 per person served. The cost per pound of waste collected gives a result of $1.81 per pound. Costs based on persons reached through the media (i.e., public service announcements on radio and TV, for example) amount to $.01 per pound per person. Finally, the cost would be $.04 per pound household based on the number of households that could take advantage of the program if they wanted to.

If collection programs are viewed as a community service, this latter way of looking at costs becomes important. They become similar to the services offered by the fire department. Everyone benefits by having the service available, whether it is used or not.

Finally, Purin talked about reducing costs. A specific example of cost reduction, where costs were reduced almost by half, came through a joint cooperation of business, local government and the local university. The city and county of Fresno had a program which last year cost them approximately $75,000. Fresno approached the university and offered to give them $40,000 in return for the university's commitment to run two collection programs a year. The university agreed to assume all the costs and liability. They will tap into the classes at the university in science and chemistry and provide the students with practical experience in the hazardous waste management field and well as providing a volunteer base. The county will coordinate all the labor. They have excellent support from area businesses in giving labor to the project. On-site emergency response and responsibility for the publicity is also being taken on by business.

This exciting cooperative venture with its dramatic savings is something conference participants might wish to look into if there is a university or similar institution in their community.

## PERMANENT SITES

Diane Christensen, Environmental Specialist, San Bernardino County, CA

A slide presentation with audio entitled "Establishing a Permanent Household Hazardous Waste Collection Center" was shown.

[Editor's note: The following has been edited to eliminate material covered in other conference presentations.]

The San Bernardino County Department of Environmental Health Services (DEHS) was one of the first agencies in the nation to address the issue of HHW and to recognize the need by establishing permanent collection centers for these wastes.

Agencies considering opening a permanent HHW collection center must first ask themselves whether they really need one. A community may or may not be suited for a collection center which operates on a permanent basis. Community organizers should carefully consider such things as:

1. the size of their community
2. the amount of hazardous waste produced by its residents
3. the availability of land for the permanent site
4. funding and community support

Another key decision is how to handle the wastes.

1. Will wastes be collected and stored until disposal?
2. Will some form of simple treatment take place,such as paint and solvent consolidation or acid/base neutralization?

These considerations need to be addressed during the planning phases so that storage and work areas can be designed and built to accommodate these activities.

The next key consideration is funding.

1. Use existing agency funds
2. Seek new funds through grants or other sources
   For example, San Bernardino initially began its program as a pilot project funded through a grant from the CA State Water Resource Control Board. Because the grant was only a temporary funding source, a county landfill tipping fee was established to provide the necessary monies to keep the program operating.

Site selection is the next step after obtaining a funding source. Criteria for selecting an appropriate location are as follows:

1. Availability of land.
This is the first consideration, because there are often legal procedures required to obtain and operate the facility on a specific site. Centers can be built on open city or county land, or can be located on existing sites, such as fire departments. Cost of the land and whether the land is large enough to contain the center and its associated activities are other factors to bear in mind.

2. Public accessibility and safety.
Accessibility is important because the public may not be willing to bring in wastes if they are inconvenienced. Centers should be located on roads which are easily accessible and well-maintained. Heavily congested traffic areas should be avoided. Operating hours should be ones convenient for most residents. Safety is perhaps the most important consideration of all. An obvious safety precaution is to plan sites away from schools, hospitals, large public buildings and high hazard areas. Often overlooked but of equal importance is a plan for emergency spills and accidents. There should be a comprehensive plan for handling any unforeseen emergencies. Centers should have a fairly high degree of security, such as a fence surrounding the center and a locked gate.

Staff selection. Staff selection may affect the location of the center and hours of operation. It is important that center personnel have had training in the handling of hazardous materials or wastes, training in chemistry or both. San Bernardino DEHS, as the operating agency, selected personnel from their own hazardous waste and toxics control section for program oversight and supervision. They also contracted with the County Agriculture Department and several fire agencies to staff the six collection centers. This staffing plan worked well because the agriculture department staff were knowledgeable in the safe handling of pesticides and other chemicals, while the fire fighters were trained to deal with chemicals in fire situations and some had received training in hazardous waste emergency response techniques.

Layout:

Although the collection center can be set up in a number of ways, separate areas within the center should be designated for specific activities:

1. a separate area for accepting wastes from the public
2. an area designed to accommodate a storage section, empty drums and supplies
3. an area can be set up for consolidation of paints and the handling of other products.

### Storage

San Bernardino County has a portable, modified roll-off dumpster to store 55-gallon drums of waste until disposal. This is only one type of storage facility. The following specifications should apply to any storage of HHW:

1. the ability of the facility to house the quantity of waste generated during a specified storage time. For example, the San Bernardino shed will hold thirty 55 gallon drums, which is the maximum estimated volume generated between monthly disposal runs.

2. the facility should offer secondary containment in the event of drum or container leakage and should be built or coated with corrosion resistant materials.

3. incompatible wastes should be segregated in some way within the facility. The San Bernardino sheds have accommodated this need with a 6" berm.

4. a good ventilation system should be built into the facility to provide air flow and the exhaustion of vapors. Roof-mounted turbine ventilators seem to work well in most storage units.

5. the facility should be equipped with appropriate emergency and safety equipment. Equipment should include:
    a safety shower
    eyewash
    chemical fire extinguisher
    an emergency warning device
    personal safety equipment: gloves, goggles, aprons, respirators, booties.

### Handling the Wastes

When site personnel accept wastes from the public, special care should be taken to properly handle and store them.

Records should be kept of all waste products brought into the shed as well as the type of waste management technique used. One method of tracking wastes stored in drums is to tape log sheets directly onto drum lids and to enter all data about the type of waste and its ingredients onto the sheet before the wastes are packed.

Lab-packed materials should be placed in drums in their original containers and between layers of an absorbent, non-reactive material such as vermiculite.

Drums should be numbered and labeled so that all wastes are accounted for and the possibility of incompatible wastes being mixed together is eliminated.

Personnel should take a mandatory training program. This program should be repeated on a periodic basis so that all individuals know about the wastes they are dealing with and the current laws which may affect them.

Training is particularly important when existing personnel are to be utilized. This training can be done by local environmental or public health agencies knowledgeable in hazardous waste management.

In addition to training in handling techniques, site personnel can also benefit from information about waste management alternatives, such as recycling, incinerating, and treating wastes instead of landfill disposal without treatment, as well as encouraging the 3 Rs: reuse, reduce, and recycle.

## Legal Issues

The location of a center, the laws of a particular state and the waste management techniques used relate to legal issues. Legal aspects of a permanent center should be considered early in the planning process.

At a minimum, a new center needs to comply with EPA and other federal requirements and to adhere to applicable state regulations. Permits may or may not be required for a center, but to ensure proper compliance it is best to check with the state agency or EPA regional office.

In CA, the state issues a variance (from the hazardous waste facility permit requirements) for those centers which only collect and directly dispose of wastes. If any further treatment or handling of wastes is done, a TSD (treatment, storage and disposal) permit is required. If any extremely hazardous wastes are handled, a separate permit must be issued as well.

Manifesting requirements are closely related to permits. Any time a waste is transported, for any reason, a manifest is required from the state agency. There are exceptions. For example, in CA, manifests are not required when transporting latex paint, and only the hauler's manifest is needed when transporting solvents.

The following information should be included when a manifest is required:

- a description of the waste and its quantity
- the generator's EPA ID #
- the hauler's ID #
- copies of the inventory sheets and any required permits
- the designated disposal, treatment or recycling site
- any specific handling procedures for the waste

Promotion and Education:

A plan to promote a center should be developed early. There are many tools available, such as the media, merchandise items, and contests. Placement of publicity pieces in high visibility locations is important, as well as presentations for community groups and schools.

Publications by the San Bernardino County DEHS are available at no cost to assist communities in establishing permanent centers. They are:

"The San Bernardino County Pilot Project: Household Hazardous Waste Collection Centers Booklet"

"The Program for Management of Small Quantities of Hazardous Waste -- Final Report"

## EDUCATION AND PUBLICITY

Joan Dotson, Hazardous Waste Chairperson, League of Women Voters of Redlands, San Bernardino County, CA.

In order to develop a HHW collection program pre-planning is the key to success. It is absolutely vital that the planning begin at least six months in advance. Even this may not be enough time. It depends on who the planning coordinator is.

Since education is an important aspect of a collection program the content of the education program should address the following:

1. HHW -- What is it? Hazardous waste is defined as any substance that when disposed of, poses a risk to people or the environment. There are many household products that fit this definition. For instance, household cleaners and polishes, drain openers, oven cleaners, used motor oil and pesticides. This information comes as a shock to most people.

2 Why should people be concerned about HHW?

According to a Southern California Association of Governments (SCAG) growth forecast policy updated March 1987, projected population is estimated to grow to 18.3 million people by year 2010. That's an increase of 47 percent or simply put, another 5.9 million people will be living here in an additional 2.9 million dwelling units. People must consider that these additional households will be using and discarding chemical products and what the cumulative effect could be on the environment without these HHW collection programs.

3 What can be done about HHW.

Everyone needs to minimize the entry of hazardous waste from households into municipal solid waste streams. This can be accomplished by the public becoming educated about using alternatives, there is an excellent booklet entitled, "Making the Switch" available through the Golden Empire Health Planning Center in Sacramento. There is a HHW wheel to hang on doors from Environmental Hazards Management Institute in New Hampshire that lists non-toxic alternatives and is easy to use. The League of Women Voters of Redlands and the city of Redlands purchased these to distribute to the community.

Less reliance on consumer products that contain toxic chemicals will reduce the amount which needs to be disposed of. The message to get across in education and publicity programs is that HHW management practices need to be changed now.

4 What happens to the waste when it leaves a HHW collection site?

Wastes such as latex paint, waste oil, and car batteries are generally recycled. Some organic wastes may be incinerated. Other wastes which cannot be treated or recycled are properly packed and transported to a hazardous waste landfill, rather than to a municipal landfill.

The public must accept the fact that if we produce hazardous waste we are going to have to be responsible for it and if we want to protect our environment and health, we have to be willing to investigate the solutions newer technology offers us and be supportive of decisionmakers and industry in siting such facilities so we can begin using them.

## EDUCATIONAL RESOURCES

1 Speakers bureau -- knowledgeable and credible speakers are a powerful educational tool. Contact the president of the local League of Women Voters or the county environmental health department. They will help you not only with speakers but assist you in setting up a public meeting to inform citizens on hazardous waste issues. For example, the San Bernardino County Environmental Health Department offers to provide staff and audio-visual material to any group that will provide the time, place, and audience.

It is also important to be able to provide bilingual speakers in areas where that is appropriate.

2 In Redlands, the local Fire Chief gives talks in our community about HHW. It is the specially trained firemen that staff Redlands' HHW facility so the fire chief is always up-to-date on the management of the program and makes a very convincing speaker. The public trusts him and therefore listens to him.

3 A possible option is to set up a hotline for reporting hazardous waste spills and incidents.

4 Another excellent educational tool is the school curriculum for grades K through 12 entitled "Toxics in the Home" provided by the

Golden Empire Health Planning Center in Sacramento. (After completing the curriculum the children of San Bernardino county were taken on tours of the permanent HHW collection center in that county.

5 The League of Women Voters of MA has produced an excellent video that is available for purchase or rental.

6 The conference packet includes bibliography of household hazardous materials. (See Appendix VI)

## PUBLICITY PROGRAM

Publicity is not a substitute for community education, however a series of feature articles in the newspapers done in advance of a HHW collection program can be the first step to educating the community on HHW. Articles can begin to make the public aware of the role they play in the overall hazardous waste problem as well as alerting them to the hazards of the products they so routinely use in their home.

## NEWSPAPERS

A budget should be developed for cost of the ads. A determination should be made about how many can you afford to purchase, what size, what design, what days to run them, and even what pages to place them on. We found with fresh advertising the use of the collection center increases dramatically. There are public service anouncements that the newspaper will run and they will run HHW collection ads as fillers whenever they can.

## MAGAZINES

A feature article in a local magazine is very helpful. Many of these publications are short-staffed so someone can offer to be interviewed or better yet a well-written article can be submitted. See if there are businesses that want to develop community goodwill and will perhaps underwrite the cost of an HHW advertisement. Don't let a lack of money stop your efforts.

## POSTERS, FLYERS, BOOKLETS, AND BROCHURES

Contact ad agencies and PR firms for donations of design work. Many of them don't have the time to do community volunteer work but will donate in lieu services to get credit for participating. All of the design work on printed materials and advertising should be coordinated so that it is easily identified with the collection program. There is a lot of material available. You do not need to design your own.

Flyers and brochures should be distributed to all schools, libraries, city hall, community centers, senior citizen centers, chambers of commerce, etc. Local Girl and Boy Scouts can distribute flyers at local shopping centers and earn badges for community work.

In Redlands, Dotson's community, they send out trash and water bills in an envelope so announcements can be included about HHW collection in those mailings.

Redlands has ordered decals to be placed on trash cans forbidding hazardous waste to be placed in the cans. San Bernardino county has recently provided similar decals for the trash cans also.

### OTHER

There are many other items available for use in advertising HHW collection center such as printed T-shirts, bumper stickers, magnets for doors, pins etc. A committee should be formed to determine which of these might appeal to the community.

### RADIO AND TELEVISION

Dotson recommends contacting station managers and their program managers and always pay a personal visit to them, when getting the requirements for submitting information for public service announcements. Participation on a local talk show is also a possibility.

### SPECIAL INTEREST GROUPS AND ORGANIZATIONS

After determining the president of each organization, write a letter requesting space in the organization's to provide newsletter. Ask who the program chairperson is and offer to provide a speaker for one of their programs.

## Conclusion

Referring to Dr. Vogel's statement that public motivation and participation are essential to the success of any HHW program whether it is in the United States or abroad, Dotson closed by stressing the importance of paying attention to publicity and public education as key ingredients to success.

## MANAGEMENT OF COLLECTED WASTES

Judy Orttung, Technical Consultant, San Bernardino County Health Department, California.

"Alternatives to Landfilling Household Toxics", put out by and available from the Golden Empire Health Planning Center in Sacramento, was recommended by Orttung (one of the book's co-authors) as a compendium of creative ideas from across the country of ways to manage HHW. Emphasis is placed on the need to reduce the use of household products, on reusing products where it is possible, and creative management and disposal of wastes.

Observing a shift from one-day collections to permanent sites, Orttung pointed out some differences in the management of the wastes collected. This is based on San Bernardino's experience since opening its permanent collection sites in 1985. Originally there were two, now there are six sites. The benefits are there of being able to store the waste and having the chance to find a creative way to dispose of it, being able to avoid the stress of having to pack up everything and get it off-site on the day of the collection and so forth.

There is another side to this story, however. At a one-day collection the professional waste hauler, usually affiliated with a disposal site, packs the wastes. There have not been problems of having those wastes accepted. At the permanent sites in San Bernardino County, county staff have operated the sites. One problem encountered has been that the corporate policies of companies do not allow them to accept wastes that they have not actually lab-packed or at least have had oversight of that lab-packing. Even though they are ultimately trying to reduce what goes to a landfill there are some problems in getting those wastes accepted. Orttung urged communities considering permanent sites to issue RFPs and work closely with a waste management company from the outset. Different corporations have different practices for how they package the wastes. The Department of Transportation (DOT) standards may be the same for all the materials; however, once it gets to the disposal site handling procedures may be different. The waste has to be packaged according to that particular company's requirements, so you need to know who will be receiving the wastes from the beginning.

When it comes to HHW, it is a "moving target," as a handling issue. Acceptable practices yesterday are not acceptable today. The laws and regulations on hazardous waste are changing at a very rapid pace. San Bernardino has had the experience of running its HHW program within the larger agency which is responsible for regulating (SQGs). They have had the regulations come into the program, they have the trade journals, they have seen the ads for the various handling methods, they are aware of what's out there.

For communities new to the issue and not knowledgeable about hazardous waste laws, there needs to be a way to bring them into this information network. Based on the valuable exchange of information at the conference, which gives a perspective on what is going on nationwide, Orttung suggested a monthly newsletter highlighting the successes and also the problems of programs across the country and asked that this proposal be considered.

# CLOSING REMARKS

## WHERE DO WE GO FROM HERE?

David Conn, Associate Director, Center for Environmental and Hazardous Materials Studies, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

The following is the text of Dr. Conn's speech.

I suspect that most of you at the conference, in fact the reason you are here at the conference, is that you believe that there are significant risks to human health and the environment as a result of the presence of HHW in the municipal solid and liquid waste streams. Looking at the nature of some household wastes it certainly seems that they have a potential to do so. However, beyond anecdotal evidence, I think we should realize that the present scientific evidence on this point -- on the nature and scale of problems in practice -- is very poor indeed. In fact, it's almost non-existent. There are many studies out there, many are very good studies, but, for the most part, if you look at them very carefully you will find that they only partially cover the topic or they were done for some other reason and are being adapted in the hope of being able to draw conclusions on the subject. For a variety of reasons, just about every study has problems in terms of being able to draw definitive conclusions about the nature of the HHW problem.

The various studies that have been done on landfills and leachates from landfills where there are comparisons between municipal waste landfills and industrial waste landfills almost invariably have the problem of how to know exactly what went into the municipal waste landfill. We all know the compliance for SGQs is pretty poor. You can never be sure that what you are seeing in a municipal waste landfill and what you are seeing coming out of a municipal waste landfill has come from HHW, because it could have come from all kinds of other places. We have to be very, very careful in terms of the way we interpret that information.

Therefore, the first thing in terms of looking at "where to go from here?" -- which was part of the title of my talk -- seems to me -- even though it is very difficult to do -- to improve on these studies. We need to look very, very carefully to get a better sense of what is in the waste stream and what is the ultimate fate of what is in the waste stream.

In the meantime, for a variety of reasons, many people believe in the value of HHW collection programs. Again, that is obviously the reason that most of you are here. I think it is a very reasonable position to take. Generally speaking, the reasons are:

1. To minimize the risks (we are concerned with risks here) of damage to human health and the environment.

2. To minimize liability.
3. To educate the citizenry and increase citizen awareness.
4. To empower the citizenry to do something about a problem they perceive.

As a result, as we all know, there have been a whole host of programs that developed over the last few years at the local, regional and state levels. We should, I believe, in the year to come or the years to come, continue to monitor these programs carefully, examine the innovative ideas that people have so successfully come up with and basically push ahead with trying to improve the programs. Improve the efficiency of the way we bring the wastes in, improve the participation rates, try to minimize the costs and so on and so forth -- all the things that really occupied the main part of this conference, and correctly so. We should continue with that. I certainly hope that we will have conferences to come and maybe newsletters to come so that we can all share in the results of that monitoring exercise.

At the same time, however, I would like to mention a few problems that we have to recognize and which have to be overcome. First of all, as has been mentioned several times at this conference, we have some special wastes, such as dioxin-containing wastes, for which we do not have present solutions. We must find solutions to those problems. They may be technological solutions, they may be institutional or economic solutions. We must find solutions, because right now we are stuck with them. All we can say is take them home and store them. That's not satisfactory and we have got to do something about it. That's certainly a challenge that we have to meet.

We have to worry about the 98 precent of households who do not participate in these collection programs. We have to recognize, I think, that however successful we are in our efforts, and I think we all hope that we will continue to be increasingly successful, that the participation rate is not going to go up hugely. In fact, if it did go up hugely we would have other kinds of problems. So we have to worry about all those households that are not going to participate in these collection programs. Of course, we should recognize that there are other things that are going on at the same time. Hopefully getting the word out to reduce, reuse, recycle, and so on. Hopefully we are reaching a number of these other households in different ways. But the fact is that they are going to have hazardous products left over, hazardous waste that they are going to need to dispose of. They are not going to come to the collection programs. We should be addressing how we can reach these people and somehow do something about these wastes if we feel they are a problem.

We also must worry about helping households in communities that choose not to hold programs. I think we must recognize and respect the fact that many communities will look at the benefits, the costs, the risks of holding these kinds of programs and, on a very rational basis, decide it is not for them. My university and my hometown is in southwest VA. Whereas Fairfax, Chesterfield, and the Norfolk area are into running collection programs, and have appropriately decided to do that, I cannot see the small rural communities in southwest VA running this kind of program. The costs are too high, and they would not consider -- and this is my opinion -- that this would be their first priority even when they are spending money on environmental programs. We have to respect that many communities are going to make a conscious decision not to get involved with these programs. That leaves us with a very big problem.

Go to the back of the conference room and look at some of the booklets and look at the solutions or the recommended disposal actions that we should take. With a variety of household products many of them say: "Save for a collection day." But what if there's not going to be a collection day? This year, next year or anytime in the foreseeable future? We have to address that problem. We have to address it with perhaps a second-best solution for many of us. The first-best would be to have a collection day, in the opinion of many of us, but the second-best solution has to be looked at, too. If that means suggesting that you wrap well and put in a landfill that may be anathema to a lot of you, but that may be the best second-best in that situation. If we don't have collection days what advice should we be giving to people who come along and say "we have a problem, we want to deal with these wastes properly, but what can we do with them?" Right now, it is very difficult to respond to that kind of problem. I have calls all the time like that. The Department of Waste Management in VA gets calls and I am sure everyone gets calls. If there is no collection day we don't have good answers. We cannot give up on these communities. We have to address this problem, too.

Finally, we have heard a fair amount at one time or another during the conference about very small quantity generators, the so-called conditionally exempt, the less than 100 kg. per calendar month, conditionally exempt in some states (not all, of course) and SGQs. We all recognize, I think, that enforcement and compliance is significantly less than perfect. I think that is a considerable understatement in terms of dealing with the problems posed by those generators. In fact, many of those wastes are still finding their way, one way or another, into landfills and other kinds of disposal facilities. In many ways, the non-regulated wastes or those who through non-compliance are being treated like unregulated waste, at least getting away with it for the time being, are akin or maybe more akin to household waste than they are to industrial waste. I think we should be looking very carefully at those.

We shouldn't be looking at household waste in isolation. I was pleased that several speakers basically made that same point. We need to be planning and implementing programs that deal with a wide variety of different kinds of hazardous waste, including those wastes that might end up in our municipal landfills or other kinds of treatment facilities. These should be addressed, too.

Summary: What to do next? For the most part, most of you are going to continue and I think should continue what you are doing. If your communities are prepared to support collection days or if you are going to carry on the fight to get your communities, your region, your state to have collection days, fine. Continue with that. Share your experiences with us. Let's all learn about them. Let's do it better.

But also, I want to cast this note of caution. Let's keep things in perspective. Let's realize that not everyone will have the resources or the inclination to tackle HHW in particular ways that we have been discussing at this conference. We also have to think about how do we deal with these people. What is the best second-best solution?

# SPECIAL SESSION
# CALIFORNIA

## CALIFORNIA LAWS AND POLICIES PERTAINING TO HOUSEHOLD HAZARDOUS WASTES PANEL

Panelists: Alex Cunningham, Sherman Roodzant, Harold Singer, and Dorothy Rice, Gina Purin, moderator

Purin expressed her enthusiasm at the opportunity the special session provided for people to enter into a dialogue with spokespersons for the regulatory agencies with which many of them have to work. Frequently, different regional offices of the Water Board or the Health Services Department will give different advice or opinions. The panel offered the chance to address these problems. Before answering specific questions from the audience each of the panelist gave a brief presentation.

Alex Cunningham, Chief Deputy Director, Toxic Substance Control, CA Department of Health Services, Sacramento, CA.

Cunningham began by stating that the issue of HHW is critical to the whole society. In any forum where toxic materials, hazardous substances are discussed it is likely that that control of these materials is a societal problem will likely be heard. This was the case at the recent reconvening of the Governor's Task Force on Toxics Wastes and Technology and at public hearings on alternatives to those offering environmental impairment liability insurance. In including the word "national" in the title of the San Diego conference the idea of shared responsibility for an important societal problem is indicated. Not only the source of the problem but also the solution may be found in households, at least in part. Also, cooperation between government and business is essential in helping to solve these problems.

As a first step broadening of the knowledge base about HHW is necessary. In a technical age many benefits are derived from the application of science in everyday life. Cunningham cited the examples of weed-free lawns, durable finishes on our walls and floors, do-it-yourself automotive shops in home garages, etc. There is the knowledge and ability to use all of these "household wonders" but also have the ability to store them and forget about them, or even worse dispose of them improperly. This is the syndrome common to waste management, which is out of sight, out of mind. The mind needs to be brought back into the equation.

This is an age of information. There is a need to translate information into knowledge and then to have people act in a knowledgeable way. People do not want to know that miracle products also have harmful side effects. There are indications that the knowledge base is broadening, however, in the CA University system, in the toxics and hazardous substances programs, on several campuses courses are already offered on exposure to toxics in the home. There are education efforts in the schools. These need to be continued and expanded.

In Cunningham's opinion, the state is in its infancy in its involvement in managing HHW. The state does not currently regulate HHW as a category of waste. Because it is not regulated a lot of HHW is disposed of without knowledge of its potential harm. The importance of this issue was addressed in AB 2948 , known as the Tanner legislation, authored by Assemblywoman Sally Tanner. Under this legislation counties must regulate wastes. They must segregate hazardous from non-hazardous wastes. The state is assisting local governments in the planning process, and the legislation looks to the day when there will be no land disposal of hazardous waste ( i.e., untreated hazardous waste).

In Cunningham's view disposal is a temporary action to solve a complex problem. His division should encourage local governments to provide for low-cost or no-cost collection facilities for HHW. Some ways in which the Toxic Substance Control Division could help include: streamlining the process for the development of collection facilities, economic assistance in the disposal cost of collected wastes, and the creation of a permitting process that assures that this public service is conducted safely. Cunningham acknowledged that the input in this process came from many who were conference attendees.

The Toxics Division currently grants variances to local governments who conduct HHW collection days. In the last three and a half years there have been 72 collection days in CA, making it number two in the nation in the number of collection days held. They are looking for ways to streamline the variance procedure.

In the long run Cunningham sees their efforts aimed towards establishing permanent facilities operated by the counties. Collected wastes would be reused, recycled, or treated as an alternative to the disposal of the untreated wastes. Model programs are already in existence. Since 1984 county agricultural commissioners have operated permanent storage facilities for homeowner pesticides. Federal and state government actions lead to confusion, lack of funding support for promised assistance to disposal costs, and a perceived unresponsiveness to commissioners' needs to expand their programs. Cunningham acknowledged that this was not a story of success, although the program model was a viable one, one that can be looked at for better cooperation and coordination. The next series of activities should be directed at creation of an operational plan to standardize such model facilities.

His division also needs to work closely with industry to come up with better treatment technology which will lead to the need to dispose of only safe residuals, rather than untreated wastes. Technology does exist, but not on a practical scale that would work for HHW. Permanent storage and collection facilities are necessary to begin the process of having people safely manage HHW. As the technology catches up to the need, he foresees an end to the dumping of HHW into sewer systems and septic tanks. Treatment technologies are a key to the solution of complex problems such as dioxins. Along with producing and using less extremely hazardous materials a research base which describes what to do with existing compounds is critical. Cooperation between university programs and industry, in Cunningham's opinion, has great potential.

The paramount issue in the management of HHW is protection of health and safety. In the future, society will be taking an increasing number of actions in regard to our HHW. These actions will require consumer education on the safe handling of materials. He feels that the safety issue will decrease with increasing use of permanent collection and storage facilities. Emphasis must be given to worker safety and technical training. TSC division is in the forefront of providing training for staff who encounter hazardous materials in the conduct of their jobs. The time and effort in training is a necessary investment. In the permitting process, his division will pay close attention to the requester's ability to train and sustain safe management practices.

An adjunct to training is insuring risks. The insurance industry has been reluctant to date to insure those entities involved in the handling and management of hazardous materials. Insurance is most available when risks can be predicted. The toxics record is replete with unpredictability. There has been some growth in the industry's approach to toxics. It used to be that if you had any toxic materials, it went into one category generally labeled "bad stuff." All material was insured or not insured without differentiation as to potential risk. Risk management, including risk identification and assessment, is now being developed as a discipline. Risks can be differentiated. Insurance, in some instances, has dropped to a level of about $3,000 for $2 million worth of coverage. Counties which self-insure may be able to take the lead in developing more accurate risk assessments as they conduct collection and storage activities.

Legislating the use of HHW is not a simple task, due in large part to people's personal habits and people's comfort levels in using home products. As an example of the difficulty of legislating behavior, on November 3, 1987, citizens in the city of Del Mar, north of San Diego, could have voted to ban smoking outdoors within the city limits. Although it was defeated it shows how the public is feeling about legislating certain actions. The issue of personal freedom was a key to the defeat of this proposal.

In conclusion, Cunningham said that HHW reminds us that we are all in this together. A conference such as the San Diego one brings the whole problem into focus and defines the need to have policies which clarify responsibilities and assure the quality of public health. Information and education are two of the best allies in moving forward to manage HHW. In the words of Crosby, Stills, Nash and Young, "Teach your children well..."

Sherman Roodzant, Chairman, California Waste Management Board.

Roodzant commended the EPA, Dana Duxbury, and the others responsible for organizing the conference.

He began his remarks with an explanation of the CA Waste Management Board's composition and purpose. It is a public body made up of nine members, four are representatives of the general public, two represent industry, two represent local government, two are appointed by the respective houses of the state legislature. As a public body the Board wrestles with a number of issues having to do with waste management. There is no other issue with the possible exception of recycling, in which there has been such an emotional debate for those on the Board, at least during the period of Roodzant's tenure. There has sometimes been a difference of opinion between the Board and those, such as most conference attendees, who support the HHW issue.

Waste management in CA is guarded jealously at the local level both by the people of CA and the locally elected officials. The state has only an oversight responsibility in the management of solid waste. The Board sets standards and does some inspection work. Largely, it is the state's oversight body and policy-setting body, in accordance with the laws passed by the legislature. The Board is concerned with the legislation which has been set before them which directs it to do certain things in the HHW realm.

Roodzant then responded to questions that Duxbury and others had submitted to him before his talk. First question: How does Roodzant perceive the issue of HHW, what steps, if any, should the state take on this issue, and what roles should private industry and government play in respect to this issue?

To begin, Roodzant stated that the Board is very supportive of the collection programs. Although there may be disagreements on how the programs should be managed -- mandatory, curbside, permanent -- the Board's position has been to encourage the programs, but they do not believe that programs should be mandatory. They have some concerns about how the programs are advertised. They do not want to see the issue blown out of proportion.

In CA refuse collection programs are on the order of six to seven dollars a month per household. These are very low prices. Because the refuse collection is controlled by local government and influenced by the refuse collection companies at the local level people are very hesitant to experience an increase in refuse collection costs. Separate collection programs, for HHW or for recycling, mean significant rate increases. The refuse industry, in order to keep up with increases in the cost-of-living, had difficulty achieving the rate increases they needed to break even. Roodzant took time to acknowledge the contribution of the refuse industry to the protection of the environment. Too often the private refuse collection industry is accused of being irresponsible. In his limited tenure with the Board, he has come to see that people of the refuse industry were probably the original environmentalists. They were collecting refuse before people thought it was necessary. There are strong health reasons for collection, and we now benefit from regular collections. This same industry has a vital interest in this issue. Caustics and acids affect refuse collectors. Looking at it from that perspective they need to balance this with what they perceive to be the public's perspective. He cited the examples of saccharine and aspertame. Saccharine was virtually put out of business, replaced by aspertame, and now it is being found that aspertame (nutrasweet) is probably more harmful than saccharine. Roodzant feels that HHW should be looked at in the same light. There are some serious problems out there with hazardous waste. Industry and small quantity generators are part of what they deal with everyday.

In terms of HHW, how does the public perceive the issue? Because he travels throughout the state, he feels that he knows the pulse of the people of the state. He thinks that it is important not to exaggerate the risks -- to be careful not to blow our credibility. Citing the example of peanut butter being put on the list in connection with Proposition 65 (CA's toxic warning law) he feels that a similar situation could come up with HHW.

The percentage of participation in HHW collections can be increased, however he warned that if this effort to promote participation is not done in a very responsible way it could be self-destructive to the program.

Second question: What is the state's role? The Tanner bill has given the Board the charge to come up with and promote a good educational program. The legislation also established an advisory committee to the Board. The committee (on which Judy Orttung and Gina Purin served) recently concluded its activities and the Board will be considering their report. [Editor's note: the report was to be reviewed by the Board on November 5, 1987 the day after Roodzant's talk.] The report includes their concept of public information, of a generic list of products which they believe should be set forth as the list, a model collection program, and so forth. The Board's concern is that it be done in a very incremental approach. He was happy to hear what David Conn said in his closing remarks about the need to know more about what HHW is doing in our landfills. It is not to say that the Board thinks that nothing should be done, however there needs to be investigation of what is happening in the landfills. He speculated that some of the toxics in the landfills are being neutralized just as they are in treatment processes across the nation. On the other hand, they have been told that even if all the household toxics were taken out of the landfills that there would still be some toxic properties coming out of the landfills just by the very nature of the process that goes on in landfills.

Therefore, the Board believes that significant continued research needs to be done. The Board is asking the legislature for funds. They will meet with the EPA urging EPA to more research in this area. It is a question that needs to be answered before asking the public to support the costs of separate programs and all the problems that go along with them.

What then does that leave for local government and private industry? The Board encourages communities to handle these issues in the way that they feel is in the best interest of their citizens. Many municipalities are setting up those programs and the Board is supporting their efforts with as much support as the Board can muster. Senate Bill 2448, by Assemblywoman Easton, was just passed. It is a kind of "solid waste" superfund for the state. In the legislation 20 percent of the revenues collected are set aside to be directed to hazardous waste in municipal landfills and enforcement related activities.

At Gina Purin's request, Roodzant explained the process that will take place for the distribution of that money. The bill requires the Board to set guidelines for the distribution of funds. There is a lot to be done with the many components of the bill. The Board works through an open process. Conference attendees were welcomed to participate. The anticipated money will run to about $4 million per year (20 percent of the receipts). Although it is not a lot of money it is better than none at all. The Board hopes it will be an asset to those running local programs.

Third question: The role of private industry in the HHW issue? Difficult question for Roodzant since he works for a government agency to speak for industry. Many of them have done what they want to do already. Many of them have assisted local governments. Private industry is playing a role and will always play a role as long as there is public demand for waste management services.

Harold Singer, Vice Chairperson, California Water Resources Control Board, Chief of the Land Disposal Branch.

His talk focused on hazardous waste disposal and HHW disposal as it relates to water quality protection. Singer stated his view that most people -- certainly those at the conference -- know that hazardous waste including HHW if not handled properly causes problems to public health and water quality. The purpose of the conference is to work to solve these problems. Certain programs of the CA Department of Health Services and the EPA are already in place to deal with the major producers of hazardous waste. Also SQGs are being dealt with now. The void still exists in the area of HHW. The public still does not perceive that the waste they dispose of, either down the drain or into the garbage pail, is going to pose a problem if not adequately controlled.

The Water Board's involvement in the disposal of hazardous wastes ranges from supporting the DHS's program of regulating hazardous waste disposal sites to a general program of regulating the disposal of all non-hazardous waste in CA. The Board strives to minimize the disposal of hazardous waste into sanitary landfills through support of the DHS program and also through load-checking programs. The latter are not intended to stop the HHW flow, but the SQG flow, which can be readily identified as it moves into the landfill. Additionally, the Water Boards are becoming involved in the remedial action that is being taken in response to discoveries of hazardous waste landfills which are leaking and non-hazardous waste facilities which are also found to be leaking.

For the benefit of the out-of-state audience, Singer briefly described the Water Resources Control Board and the nine regional boards. The State Board is a five-member board which allocates water rights and establishes policy for water quality protection in CA. The regional boards are semi-autonomous. There are nine part-time members on these boards. The regional boards are located by watershed, from San Diego all the way up the coast into the rest of the state. The boards, with staffs of engineers and scientists, act in accordance with state and federal law and policy, as well as the regulations established by the State Board. Each region is guided by a water quality control plan. These plans are established to protect various beneficial uses of the water bodies or water resources within their region. The plans take into account land forms, vegetation, rainfall, population patterns and the economy in general. Before discharging waste into waters of the state, whether underground or surface, a community or a business must get a permit from a regional water quality control board. The regional control board can monitor compliance with the permits and take enforcement action as is appropriate.

The Water Board has established a system for classifying wastes and waste disposal sites. The system is intended to prevent problems or at least identify the proper containment that needs to be provided for the various degrees of risk that are associated with waste that is produced in the state. The three classifications of waste utilized in the state are:

1. Hazardous waste: The Board uses the definition used by DHS.
2. Designated waste: A waste that if disposed of in a sanitary landfill would be too mobile or too persistent, or contains toxicants that would move into the environment.
3. Non-hazardous solid waste: Ordinary domestic refuse is in this classification. This includes HHW.

Site classification: For hazardous waste, designated waste and non-hazardous waste sites the categories are very similar to waste classfication.

Both the hazardous and designated waste sites are designed and the regulations for them require that the wastes be isolated from waters of the state. Although everyone knows that there is no such thing as complete containment, they are looking at containment as a way to keep these wastes out of the water supply.

The non-hazardous waste sites primarily rely on a combination of containment and certain siting criteria, such as separation from a water body, to provide for the protection of water quality. It is for this reason that the Water Board is trying to minimize the amount of hazardous waste that comes into these facilities, since those sites were never designed to provide containment for that type of waste.

Given the findings that non-hazardous disposal sites are leaking the State Board is implementing a program at this time to determine the magnitude of this potential problem. This program, called the Calderon program, is requiring that all landfills, both active and inactive, complete a solid waste assessment test (SWAT) to determine whether any wastes are migrating either into the vadose zone (the zone below the ground surface and below the water table) or surface water from that facility. The State Board has ranked all sites in the state. Approximately 2,000 sites are on this ranking system. The Board is requiring 150 sites per year to submit SWAT reports. The ranking of the sites is based on what the Board perceives to be the threat that a particular site poses. They do not really know the actual threat that various sites pose. Factors considered are: location of the site, size of the site, the type of waste accepted over the years, etc.

Singer responded to a request to discuss latex paints. DHS has determined that latex paints are not hazardous. They have established a policy to allow those residual materials to go into non-hazardous waste disposal sites. The Board has concurred in that policy. The regional boards, although there is not a consistent statewide policy, pretty much follow the guidelines of DHS. DHS's policy is that latex paint cans be fully drained so that only a thin film remains in the can, that the material in the can be completely dried, that there be no toxic or flammable vapors due to thinners, and that there be no extraneous hazardous material in the can being disposed of.

Up until now the Water Board has followed that policy. Some of the HHW collection programs have not been taking latex paints to landfills because of the water content. They do not wish to see a lot of water going into non-hazardous waste landfills. In the past, that was the primary reason latex paint did not go to solid waste landfills.

Singer referred to the ABAG (Overview of Collection Programs, "Regional") approach of spreading the paint over a clay pad at a Class III landfill and allowing it to dry, thereby eliminating the water content problem.

During this process samples were taken of the clay. In general, all of the samples were below DHS "hazardous" standards. However, they did find mercury both in the waste and in the clay, at levels three to four times the concentration established by DHS. Technically, this would make the paint a hazardous waste. This is a one-time sampling that must be looked at. (The background soil in the area did not contain high levels of mercury.) The regulatory agencies need to make some decisions on this question very quickly.

There needs to be a two-pronged approach to dealing with the issue of HHW. The first is the collection program effort, which minimizes the disposal of HHW into sanitary landfills. It is important to realize that 100 percent of the population is not going to be reached. Some hazardous waste will continue to go to solid waste landfills. Therefore, the other half of this program is a re-evaluation of the premise on which the non-hazardous waste landfill is currently being regulated.

Recognizing that hazardous waste will be going into these landfills, appropriate containment provisions should be implemented so that a SWAT done 30 years from now will show that we learned from our mistakes and that we have not passed a problem down to future generations.

Dorothy Rice, Senior Consultant to the California State Assembly Committee on Environmental Safety and Toxic Materials. Rice is a member of Assemblywoman Sally Tanner's staff.

After giving thanks for what she had learned by attending the conference, Rice addressed her assigned topic, the legislative perspective on the issue of HHW. Her perspective, she suggested, might be somewhat different from the perspectives of those actively involved in collection programs and would shed light on why she and Assemblywoman Tanner have been involved in this issue.

Landfill operators or local government employees get involved in collection programs because they wish to minimize the amount of hazardous waste that ends up in a landfill and this arises because of obvious concerns about the eventual environmental fate of that waste. Through work with employees of government agencies, environmental groups, public interest groups and community groups there has been recognition of the public's need for more and better information on the safe use, storage and disposal of the literally thousands of consumer products which contain hazardous or toxic ingredients.

While both of these reasons were of interest to Assemblywoman Tanner, her original interest in HHW evolved from a very different issue, one which was not really discussed at the conference. The issue is the siting dilemma, the so-called n.i.m.b.y. not in my backyard syndrome, the inability of the state to site and/or permit hazardous waste treatment facilities. The public opposition is perfectly understandable and in many cases, given the kinds of facilities people want to build and where they want to build them, the opposition is warranted. However, as everyone knows, the vast majority of the hazardous waste which is generated in CA and in the nation continues to be managed through land disposal. This is certainly not the way it should be.

Rice pointed out that it seemed from what she had heard at the conference that this is true for the vast majority of wastes collected at HHW collection events. The wastes are lab-packed and disposed of to land. If this equation is ever to be turned around to reflect a better mixture of management options -- recycling, treatment, waste minimization -- additional facilities will have to be sited in CA and throughout the nation. It was for this reason that in 1982

Assemblywoman Tanner authored legislation which created a group called the Hazardous Waste Management Council. This group was directed to develop recommendations to resolve the so-called siting problem. In 1984 the 79 recommendations of this group were published as a document entitled "The Hazardous Waste Management Plan." Subsequently, these recommendations were crafted into legislation. The bill (AB 2948) thus created was vetoed in 1984 and again in 1985. It was finally signed by the governor in 1986 and became law January 1, 1987.

AB 2948 is a complex and lengthy bill which calls for county and regional planning for hazardous waste management. It outlines a siting and permitting process for hazardous waste management facilities, treatment facilities and disposal facilities for the residuals of treatment. To illustrate how this overall hazardous waste management statute relates directly to the subject of the San Diego conference, Rice read a passage from the intent section of AB 2948:

"Because the state's economy and quality of life are dependent on many substances and products that result in the production of hazardous waste all Californians must share in the responsibility for finding safe and effective solutions to the management and disposal of hazardous wastes including efforts to reduce the amount and hazard of this waste."

This intent language was developed because the Hazardous Waste Management Council's research over a 2-year period made it very clear that the public does not generally view itself as a partner in either the generation of hazardous waste or in the responsibility for its management once it is to be thrown away. Without improved public understanding of the role that everyone plays in the generation and disposal problems of hazardous waste the Council felt that the acceptance of any type of hazardous waste management facility, even a treatment facility, was unlikely. For this reason, AB 2948 calls for comprehensive hazardous waste management plans in each county in CA. Each plan is to be prepared with the close cooperation of local advisory committees and with extensive public hearings. The hope was that through the plan as many people as are interested within each county and within the cities in the county would become involved in this issue. While the focus of the county plans is on quantifying industrial waste generation and on planning for its safe management, AB 2948 plans are required to include "a consideration of the need to manage the small volumes of hazardous waste which are produced by businesses and households." This was specifically included in the bill because Tanner believed that at some point all Californians have to think about the waste that they generate and how they tie into the manufacturing economy. The legislation did not mandate the participation or the preparation of county hazardous waste management plans; however, at this point every county is involved in this effort. Through talking to DHS staff, Rice found that all counties will address the HHW issue in their plans. Some will have education programs, some collection programs, others are considering labelling and other requirements. HHW is not being ignored in the overall industrial hazardous waste planning process.

It seems likely that the county planning process will provide a focus for now and for the future for HHW management programs. As mentioned earlier, Tanner was led to author legislation specifically on HHW because of her years of work on the siting of facilities issue. On the one hand, she believed that HHW programs would provide an ideal opportunity for providing the public with information on the complexities of waste management in general. On the other hand, she was becoming more and more aware of the kinds of efforts that people such as the conference attendees involve themselves in conducting public information programs and conducting collection programs throughout that state. She wanted to do something that would support those efforts and which would give a state focus to those efforts. Therefore in 1985 she introduced AB 1809. The original versions of the bill were far more ambitious than the legislation that eventually passed and became law. Originally, there were such controversial items as a labeling requirement for products which, if they were to be thrown in the trash, would constitute a hazardous waste, mandated collection programs in counties, establishment of a state hotline for locations of collection programs and uniform information on how to handle products. Although these items were not in the bill that passed, Tanner's intent was retained, which was that the state should do what it could to assist local government efforts to educate the public and to provide collection programs for HHW.

AB 1809 requires the Waste Management Board to develop a public information program on household hazardous substances. It requires the Board to develop guidelines and state policies to assist local governments in providing services in this area. It authorizes local governments to increase solid waste collection fees to offset program costs. It created an HHW advisory committee to advise and assist the Board in developing the public information program, the guidelines and the other elements of the legislation. Lastly, the bill requires the Board to report to the legislature on specified aspects of the HHW issue. At this point, the Advisory Committee is near the conclusion of its work, is developing its recommendations to the Board, and a report from the Board is anticipated in 1988.

While AB 1809 is the HHW statute Tanner and Rice have worked on, there are others in the legislature interested in the issue. Several bills were proposed in 1987. AB 2290, was a bill on labeling, sponsored by Assemblyman Felonte, which originally was very similar to Tanner's 1809 provisions on labeling. The Senate amended the legislation so that symbols, which could be used in any state by manufacturers to indicate which products could not be poured down the drain, were taken out of the bill, against the author's wishes, and the bill is now in conference committee. Felonte is still committed to pursuit of the concept. Another bill, AB 379, by Assemblywoman Calais, is concerned with used oil. They hope to see movement on this in January 1988. The bill would require stores which sell motor oil to consumers to provide storage capacity to consumers who return used oil. It also requires that the used oil be recycled to the greatest extent practicable. The final bill is Assemblywoman Easton's bill that would provide substantial amounts of money to keep hazardous waste out of municipal landfills.

# Appendix I

## Final Program

## HOUSEHOLD HAZARDOUS WASTE MANAGEMENT CONFERENCE

**November 2 - 4, 1987**
San Diego, California

## FINAL PROGRAM

### Monday, November 2, 1987
### Opening session

**Keynote Address: EPA Perspective on Household Hazardous Waste**
Joseph Carra, Acting Director, Waste Management, Office of Solid Waste, U.S. EPA

**Defining Household Hazardous Waste**
Allen Maples, Environmental Scientist, Office of Solid Waste, U.S. EPA

**Why Worry About Household Hazardous Waste**
David Galvin, Water Quality Planner, Seattle Metro Water Resources

**State Laws, Regulations, and Guidelines Regarding Household Hazardous Waste**
Dana Duxbury, Senior Environmental Research Analyst, Center for Environmental Management, Tufts University

**Household Hazardous Waste Collection Program Liability**
James Dougherty, Section Chief, Office of Enforcement and Compliance Monitoring, U.S. EPA

**Household Hazardous Waste - An International Perspective**
Gerhard Vogel, Professor, Institute for Technology and Commodity Science, University of Economics and Business Administration, Vienna, Austria

### Tuesday, November 3, 1987
### Morning session

**Overview of Collection Programs**
Gina Purin, Project Director, Golden Empire Health Planning Center

**State Sponsored -**
- Felix Harvey, Div. of Air and Haz. Materials, RI Dept of Env. Mgt.

**State Matching Grants -**
- Leslie Lewis, Citizens Participation Coordinator, CT Dep

**Corporate Sponsorship -**
- Ryan Delcambre, Issue Manager, Waste Reduction, Dow Chemical U.S.A.

## Tuesday, November 3, 1987
## Morning session

**Regional -**
    Emy Meiorin, Senior Environmental Engineer, Assoc. of Bay Area Governments
**Paint Collections -**
    Linda Pratt, Hazardous Materials Specialist, County of San Diego Dept. of Health Services
**One Day, Multiple Sites -**
    Richard Conlin, Project Director, Seattle Metrocenter YMCA
**At a Landfill -**
    William Merry, District Engineer, Monterey Regional Waste Mgt. District
**Permanent Site -**
    Kate Gage, District Cordinator, Martha's Vineyard Refuse Disposal District
**Pilot/Permanent Site -**
    Sandi Schafer, Hazardous Materials Coordinator, Orange County Hazardous Material Program

**Overview of Other Management Options**
Susan Ridgley, Senior Pollutions Control Specialist, MN Pollution Control Agency

**Reformulation -**
    Robert Etter, V.P., U.S. Consumer Products R&D, S.C. Johnson & Son, Inc.
**Resue and Recycling -**
    Robert Ceru, Supervisor, Toxic Material and Hazardous Waste, Ingham County Health Department
**Paint Exchanges -**
    Diane Christensen, Environmental Specialist, San Bernardino County Health Department
**Telephone Hotlines -**
    Ned Brooks, Pollution Control Specialist, MN Pollution Control Agency

**Live Demonstration of Incompatibles**
Larry Sweetser, Environmental Compliance Program Manager, Sanitary Fill Company

**Overview of Special Wastes**
Judy Orttung, Technical Consultant, San Bernardino County Health Department

**Waste Oil -**
    Donald Gilson, Senior Environmental Specialist, Chevron
**Recycling Oil -**
    Douglas Kenyon, Safety and Operations Manager, Browning Ferris Industries
**Paint -**
    Robert Nelson, Associate Director for Environmental Affairs, National Paint and Coatings Association

## Tuesday, November 3, 1987
## Afternoon session

**Pesticides -**
Janet L. Auerbach, Chief, Special Review Branch, Office of Pesticide Programs, U.S. EPA
Johanne Gelinas, Program Agent for Environmental Health, Lakeshore General Hostpital, Pte Claire, Canada

**Overview of Problem Wastes**

**Dioxins -**
Allen Maples, Environmental Scientist, Office of Solid Waste, U.S. EPA
Liz McCormick, Manager, Compliance Program, GSX Chemical Services, Inc.
**Unknowns -**
Bob Turkington, Industrial Hygienist, Hazardous Technologies
**Land Bans -**
Allen Maples, Environmental Scientist, Office of Solid Waste, U.S. EPA

**Overview of Future Funding Options**
Gina Purin, Project Director, Golden Empire Health Planning Center

**International Methods -**
Gerhard Vogel, Professor, Department of Technology, and Institute for Technology and Commodity Science, University of Economics and Business Administration, Vienna, Austria

**Excise Tax Opponent -**
Donald Lofty, Vice President and Senior Counsel, Drackett Co.
**Excise Tax Proponent -**
Representative Jolene Unsoeld, State of Washington

**Three Concurrent Discussion Groups**

**Education Programs**
John Lord, Editor-in-Chief, Enterprise for Education; Panel Moderator
**HHW Bibliography -**
Leslie Lewis, Citizens Participation Coordinator, CT DEP
**HHW Educational Tools -**
Joanne Foster, Natural Resources Director, CT League of Women Voters
**A California Model -**
David Harris, Educational Director, Environmental Health Coalition
**HHW Curriculums -**
John Lord, Editor-in-Chief, Enterprise for Education

Labeling
Dana Duxbury, Senior Environmental Research Analyst, Center for Environmental Management, Tufts University; Panel Moderator

## Tuesday, November 3, 1987
## Evening session

**CPSC Guidelines -**
Lee Baxter, Director, Western Regional Center, U.S. Consumer Products Safety Commision
**FIFRA Guidelines -**
Janet Auerbach, Hazard Evaluation Division, Exposure Assessment Branch, U.S. EPA
**Pesticides Issue -**
Jay Feldman, National Coordinator, National Coalition Against the Misuse of Pesticides
**Paints -**
Donald Lofty, Vice President and Senior Counsel, Drackett Co.
**HHW Constituents and Their Impact -**
David Galvin, Water Quality Planner, Seattle Metro Water Resources; Panel Moderator
**HHW and Their Constituents -**
Girish Nair, Research Associate, Center for Environmental Management, Tufts University
**Landfill Contaminants -**
K.C. Donnelly, Laboratory Director, Soil and Crop Science Dept, Texas A & M University
**Resource Recovery Contaminants -**
William Franklin, President, Franklin Associates
**Wastewater Contaminants -**
Tim Brown, Assistant Director, Public Education, Water Pollution Control Federation

## Wednesday, November 4, 1987
## Morning session

**How to set Up a Household Hazardous Waste Collection Program**
Dana Duxbury, Senior Environmental Research Analyst, Center for Environmental Management Tufts University

**Institutionalizing the Program -**
Lise Anderson, Toxics Education Specialist, Ecology Center of Ann Arbor
**Sponsors/Co-Sponsors -**
Leslie Lewis, Citizens Participation Coordinator, CT DEP
**Site Selection -**
Darrell Cullen, Technical Services Manager, Chemical Waste Management
**Health and Safety -**
Larry Sweetser, Environmental Compliance Program Manager, Sanitary Fill Company

Wednesday, November 4, 1987
Morning session

**Contractor Selection -**
LeeAnn Merashoff, Regional Sales Manager, Northeast Solvents
**Funding -**
Dana Duxbury, Senior Environmental Research Analyst, Center for Environmental Management, Tufts University
**Costs -**
Gina Purin, Project Director, Golden Empire Health Planning Center
**Permanent Sites -**
Diane Christensen, Environmental Specialist, San Bernardino County Health Dept.
**Education and Publicity -**
Joan Dotson, Hazardous Waste Specialist, Redlands League of Women Voters
**Management of Collected Materials -**
Judy Orttung, Technical Consultant, San Bernardino County Health Dept.
**Closing Remarks:**
**Where Do We Go From Here?**
David Conn, Associate Director, VA Polytechnic Institute and State University
Dana Duxbury, Senior Environmental research Analyst, Center for Environmental Management, Tufts University

**California Laws and Policies Pertaining to Household Hazardous Waste**

Gina Purin, Project Director, Golden Empire Health Planning Center; Panel Moderator

Alex Cunningham -
Chief Deputy Director, Toxic Substance Control, CA Dept of Health Services
Sherman Rodzant- -
Chairman, CA Waste Management Board
Harold Singer -
Vice Chairperson, CA State Water Resources Control Board
Dorothy Rice -
Aide to Assemblywoman Sally Tanner

**Audience Question and Comment Period**

# Appendix II

## Speakers List

HOUSEHOLD HAZARDOUS WASTE MANAGEMENT CONFERENCE

November 2-4, 1987

## SPEAKERS LIST

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Aide to Assemblywoman Sally Tanner
California State Assembly
State Capitol Room 4146
Sacramento , CA 95814
(916) 445-7783

Susan Ridgley
Pollution Control Specialist Senior
MPCA, Hazardous Waste Division
520 Lafayette Road North
St. Paul , MN 55155
(612) 297-1453

Sherman Roodzant
Chairman
California Waste Management Board
1020 9th Street, Suite 300
Sacramento , CA 95814
(916) 322-3330

Sandi Schafer
Hazardous Materials Coordinator
County of Orange, Haz. Mat. Program
180 S. Water Street
Orange , CA 92666
(714) 834-8872

Harold Singer
Chief, Land Disposal Branch
State Water Resources Control Board
P.O. Box 100
Sacramento , CA 95801
(916) 445-9552

Larry Sweetser
Environmental Compliance Program Mgr.
Sanitary Fill Company
501 Tunnel Avenue
San Francisco , CA 94134
(415) 468-2442

Robert Turkington
Industrial Hygienist
Hazardous Technologies
2218 Old Middlefield Way, Suite J
Mountain View , CA 94943
(415) 965-6025

Rep. Jolene Unsoeld
House of Representatives
405 House Office Bldg, Mail Drop AS-33
Olympia , WA 98504
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# Appendix III

## Clarification of Issues Pertaining to Household Hazardous Waste Collection Programs

DRAFT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 14 1988

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Clarification of Issues Pertaining to Household Hazardous Wastes Collection Programs

FROM: J. Winston Porter
Assistant Administrator

TO: Waste Management Division Directors
Regions I-X

As you know, the Agency supports household hazardous wastes (HHW) collection programs. As part of this support, we sponsored an HHW conference in November, 1986, and one this past November, also. Over the past year, several issues have been raised pertaining to household hazardous wastes collection programs. These issues include the liability of collection program sponsors under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); EPA's recommendations regarding the management of HHW; and the regulatory status of household hazardous wastes that contain dioxin.

This memorandum clarifies our position on these issues and updates the January 28, 1986, memorandum from John P. Lehman to Basil G. Constantelos entitled: "CERCLA and RCRA Liability of Municipal Sponsors of Household Hazardous Waste Collection Programs" which is found in Appendix E of the EPA Report: "A Survey of Household Hazardous Wastes and Related Collection Programs, October 1986." You should note, however, that State positions may vary; the State agency should be contacted for details on the State's policies regarding household hazardous wastes.

DRAFT

1. What does EPA recommend regarding management of household hazardous wastes collected in HHW collection programs?

As you know, all household wastes are exempt by definition from the Federal hazardous waste regulations promulgated under Subtitle C of RCRA. Section 261.4(b)(1) unconditionally exempts household wastes, including household hazardous wastes (HHW), from the Subtitle C regulations even when accumulated in quantities that would otherwise be regulated, or when transported, stored, treated, disposed, recovered, or reused. This exemption also applies to household hazardous wastes collected during an HHW collection program.

Household wastes, including household hazardous wastes, are subject to the regulations under Subtitle D of RCRA. The current Subtitle D regulations governing the disposal of any solid waste are the "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR Part 257). These regulations are general environmental performance standards that are implemented by the States. Household hazardous wastes can be disposed in any solid waste disposal facility, including a municipal solid waste landfill, that is in compliance with the "Criteria" and State and local requirements.

Although household hazardous wastes are exempt from the Federal hazardous waste regulations, EPA recommends that sponsors of HHW collection programs manage the collected HHW as a hazardous waste. The community has already gone to the effort and expense of collecting these materials and Subtitle C controls provide a greater level of environmental protection. In selecting a management option, the Agency recommends that program sponsors follow the waste management hierarchy of:

(1) reusing and recycling as much waste as possible;
(2) treating appropriate wastes in a hazardous waste treatment facility; and finally
(3) disposing of remaining wastes in a hazardous waste landfill.

The Agency also recommends the use of licensed hazardous waste transporters who will properly identify, label, manifest, and transport the collected wastes for recycling, treatment, or disposal. Although sponsors are not required to manage HHW as a hazardous waste, it is clear from seeing the programs in action, that, in fact, sponsors usually contract with hazardous waste management professionals to run the programs. These contractors generally manage the HHW as a hazardous waste and usually make efforts to reuse and recycle the waste.

305

2. What is the regulatory status of household hazardous wastes that contain dioxin?

As stated above, household hazardous wastes are unconditionally exempt from Subtitle C of RCRA. This exemption includes household hazardous wastes that contain dioxin. Like any household waste, household wastes that contain dioxin must be disposed of in accordance with EPA's rules under Subtitle D of RCRA.

The RCRA land disposal ban rule issued November 8, 1986, applies only to those dioxin-bearing wastes that are specifically listed as hazardous wastes under Subtitle C of RCRA. Therefore, this rule does not apply to any household hazardous wastes and does not prohibit hazardous waste management facilities from receiving any household hazardous wastes, even those potentially containing dioxin. As mentioned above, dioxin-containing HHW are exempt from EPA's land disposal ban rule. However, we understand that, due to public perception concerns, most Subtitle C hazardous waste facilities currently do not accept dioxin-bearing HHW. EPA will explore options with State and local government so that a solution to this problem can be found. For example, we are looking at ways to encourage the waste management industry to rethink their position and accept these wastes. Some communities have chosen to temporarily store this dioxin-bearing HHW until a more permanent management option can be found.

3. What liability do HHW collection programs sponsors have under RCRA?

As stated above, Section 261.4(b)(1), unconditionally exempts household wastes, including HHW, from the Subtitle C regulations. As a result, sponsors of HHW collection programs have no liability under Subtitle C of RCRA and are not required to manage collected HHW in Subtitle C hazardous waste management facilities. As previously mentioned, however, EPA recommends that these wastes be handled as a Subtitle C hazardous waste.

4. What liability do sponsors of HHW collection programs have under CERCLA?

CERCLA does not contain an exclusion for household waste or an exclusion based on the amount of waste generated. As a general matter, any waste that qualifies as a hazardous substance under CERCLA is subject to the liability provisions of Section 107. Hazardous substances are both defined under Section 101(14) and designated under Section 102(a). If a household waste contains a

405

substance that is covered under either section (whether or not it is a RCRA hazardous waste), potential CERCLA liability exists regardless of whether the material was picked up as part of a community's routine waste collection service or was gathered as part of a special collection program.

For purposes of CERCLA, household hazardous waste may qualify as a "hazardous substance" if it contains any substance listed in Table 302.4 of 40 CFR Part 302. Communities should recognize that potential liability under CERCLA may apply regardless of whether HHW are disposed of in a municipal waste landfill or in a hazardous waste landfill.

I hope this information will assist you in addressing questions regarding household hazardous waste collection programs. We are providing copies of this memorandum to States and the major waste management trade associations. I request that you make this information available to any other interested parties in your Region. If you require additional information or clarification on these issues, please contact Allen Maples of our Special Wastes Branch at (202) 382-4683.

cc: State Solid and Hazardous Waste Directors
Dana Duxbury, Consultant to Tufts University, CEM
William Forester, APWA
H. Lanier Hickman, GRCDA
Shiela Prindiville, NSWMA
Bryan W. Dixon, ASTSWMO
Hazardous Waste Branch Chiefs, Regions I-X

5 of 5

# Appendix IV

# Household Hazardous Waste Collection Programs

TUFTS UNIVERSITY

Center for Environmental Management

# Household Hazardous Waste Collection Programs

The information contained in the following document has been collected and assembled by the Center for Environmental Management at Tufts University. The purpose of this on-going list is to provide a basic information source of household hazardous waste collection programs nationwide, as well as a vehicle for identifying program contacts. This listing includes all of the programs held or to be held in 1987 that we could identify. Detailed program data for programs held recently or to be held this year, will need to be added. Please use the attached list, or complete a program form to supply us with the necessary additions or corrections.

Given that there is no central directory or reporting requirement for these programs, our approach in data acquisition was not uniform. We utilized existing information sources, various project sponsor materials, state and municipal information, personal contacts, reporting forms, and other avenues in an attempt to be as complete as possible. We make no pretense that this is the definitive listing. In recognizing the magnitude of this task, we would appreciate your input in keeping the listings current as well as correcting any inaccuracies.

We have listed programs in chronological order. Where information was available, we specified if the program handles paint only, pesticides only, or if it is a home pickup or permanent/fixed site. Data regarding the amount of waste collected was, at times, converted from number of drums to total gallons. We considered a program as one collection program if it was held on the same day, though at multiple sites. If a program was held repeatedly throughout the year, this will be indicated by the frequency it appears in the chronological listing. The costs, amount of waste and number participants information is presented in the manner it was given to us. Although we list a single program sponsor, some programs do have multiple sponsors. Programs vary greatly in their manner of presenting this information, therefore, if further detail is needed, we suggest that you contact the appropriate person. These distinctions have been applied to the 1987 data and may not be applicable to the 1981-1986 data.

Please send any household hazardous waste collection program information to:

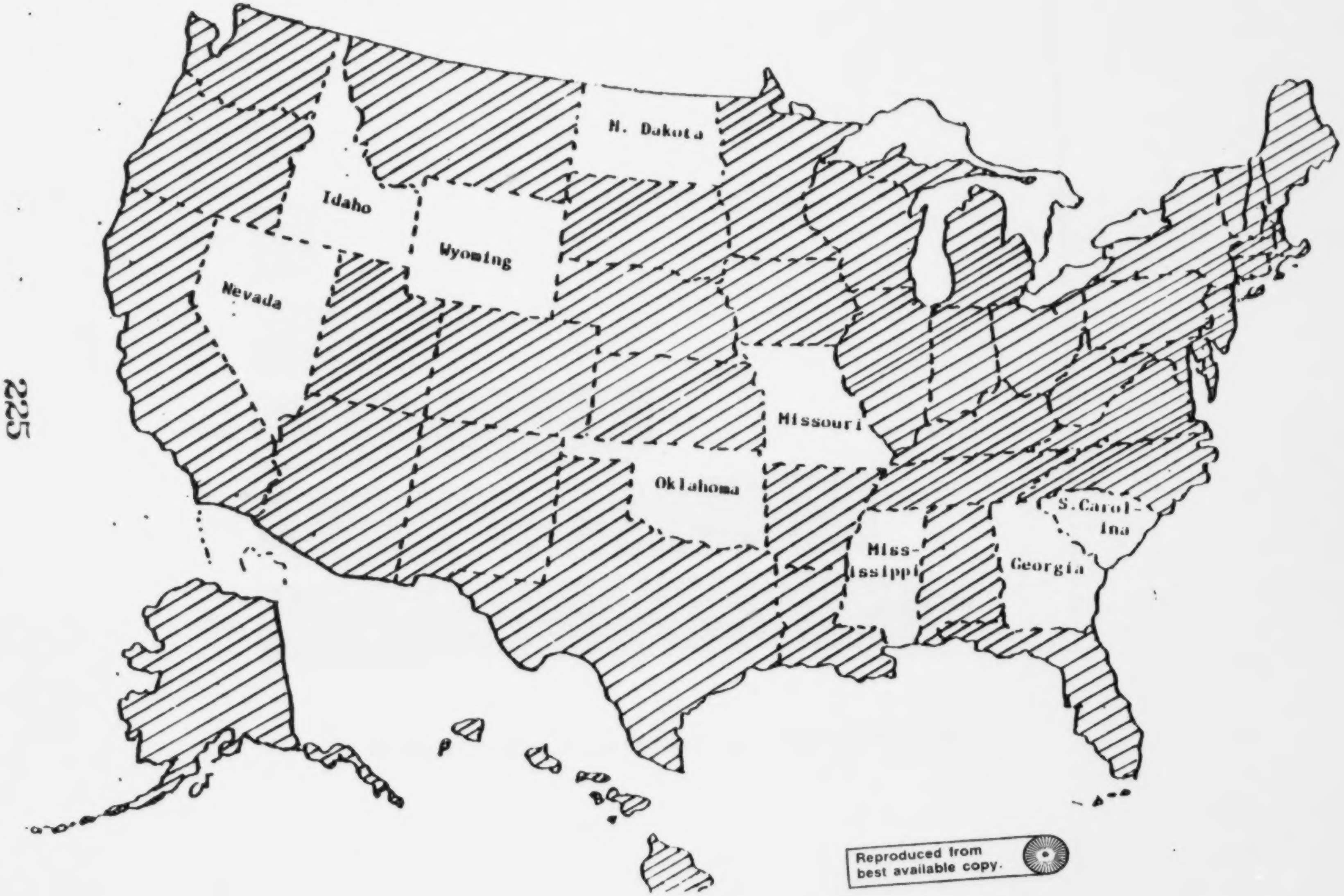
Dana Duxbury
Center for Environmental Management
Tufts Universtiy
474 Boston Avenue - Curtis Hall
Medford, MA 02155

Curtis Hall
474 Boston Avenue
Medford, Massachusetts 02155
617 628-5000
Extension 3486

# HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAMS TOTALED BY YEAR

| State | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Total |
|---|---|---|---|---|---|---|---|---|
| Alabama | | | | | 1 | | | 1 |
| Alaska | | | 2 | 3 | 4 | 7 | 2 | 18 |
| Arizona | | | | | | | 1 | 1 |
| Arkansas | | | | | | | 1 | 1 |
| California | | 1 | 5 | 12 | 36 | 24 | 72 | 150 |
| Colorado | | | | 4 | 1 | | | 5 |
| Connecticut | | | | 1 | 9 | 25 | 24 | 59 |
| Delaware | | | | | | | 1 | 1 |
| Florida | | | | 21 | 22 | 16 | 11 | 70 |
| Georgia | | | | | | | | |
| Hawaii | | | | | | 1 | 2 | 3 |
| Idaho | | | | | | | | |
| Illinois | | | | | | | 1 | 1 |
| Indiana | | | | | 2 | 1 | 2 | 5 |
| Iowa | | | | | | 2 | | 2 |
| Kansas | | | | | | 3 | | 3 |
| Kentucky | 2 | | 1 | | | | | 3 |
| Louisiana | | | | | 1 | 1 | 1 | 3 |
| Maine | | | | 1 | | 1 | | 2 |
| Maryland | | | | | 1 | | 1 | 2 |
| Massachusetts | | 1 | 14 | 31 | 33 | 78 | 51 | 208 |
| Michigan | | | | 3 | 8 | 14 | 8 | 33 |
| Minnesota | | | | | 6 | 10 | 9 | 25 |
| Mississippi | | | | | | | | |
| Missouri | | | | | | | | |
| Montana | | | | 1 | | | | 1 |
| Nebraska | | | | | 3 | | 7 | 10 |
| Nevada | | | | | | | | |
| New Hampshire | | | | 1 | 4 | 11 | 20 | 36 |
| New Jersey | | | | | 7 | 8 | 3 | 18 |
| New Mexico | | | | | 1 | | | 1 |
| New York | | 1 | 4 | 2 | 8 | 21 | 28 | 64 |
| North Carolina | | | | | 2 | | | 2 |
| North Dakota | | | | | | | | |
| Ohio | | | | 2 | | 1 | 1 | 4 |
| Oklahoma | | | | | | | | |
| Oregon | | 1 | 1 | 1 | | 1 | 2 | 6 |
| Pennsylvania | | | | | 1 | 1 | 1 | 3 |
| Rhode Island | | | | 5 | 4 | 4 | 7 | 20 |
| South Carolina | | | | | | | | |
| South Dakota | | | | | | 1 | | 1 |
| Tennessee | | | | | | 1 | | 1 |
| Texas | | | | | | 6 | 2 | 8 |
| Utah | | | | | | 2 | | 2 |
| Vermont | | | | 1 | 2 | 5 | 2 | 10 |
| Virginia | | | | | 1 | 2 | 6 | 9 |
| Washington | | 1 | 2 | | 5 | 9 | 12 | 29 |
| West Virginia | | | | | 1 | | 1 | 2 |
| Wisconsin | | | | 2 | 6 | 9 | 9 | 26 |
| Wyoming | | | | | | | | |
| Total by Year | 2 | 5 | 29 | 91 | 169 | 265 | 288 | 849 |
| Total States | 1 | 5 | 7 | 16 | 25 | 28 | 29 | |

▨ STATES IN WHICH HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAMS HAVE BEEN HELD


N. Dakota
Idaho
Wyoming
Nevada
Missouri
Oklahoma
Miss-
issippi
Georgia
S.Carol-
ina

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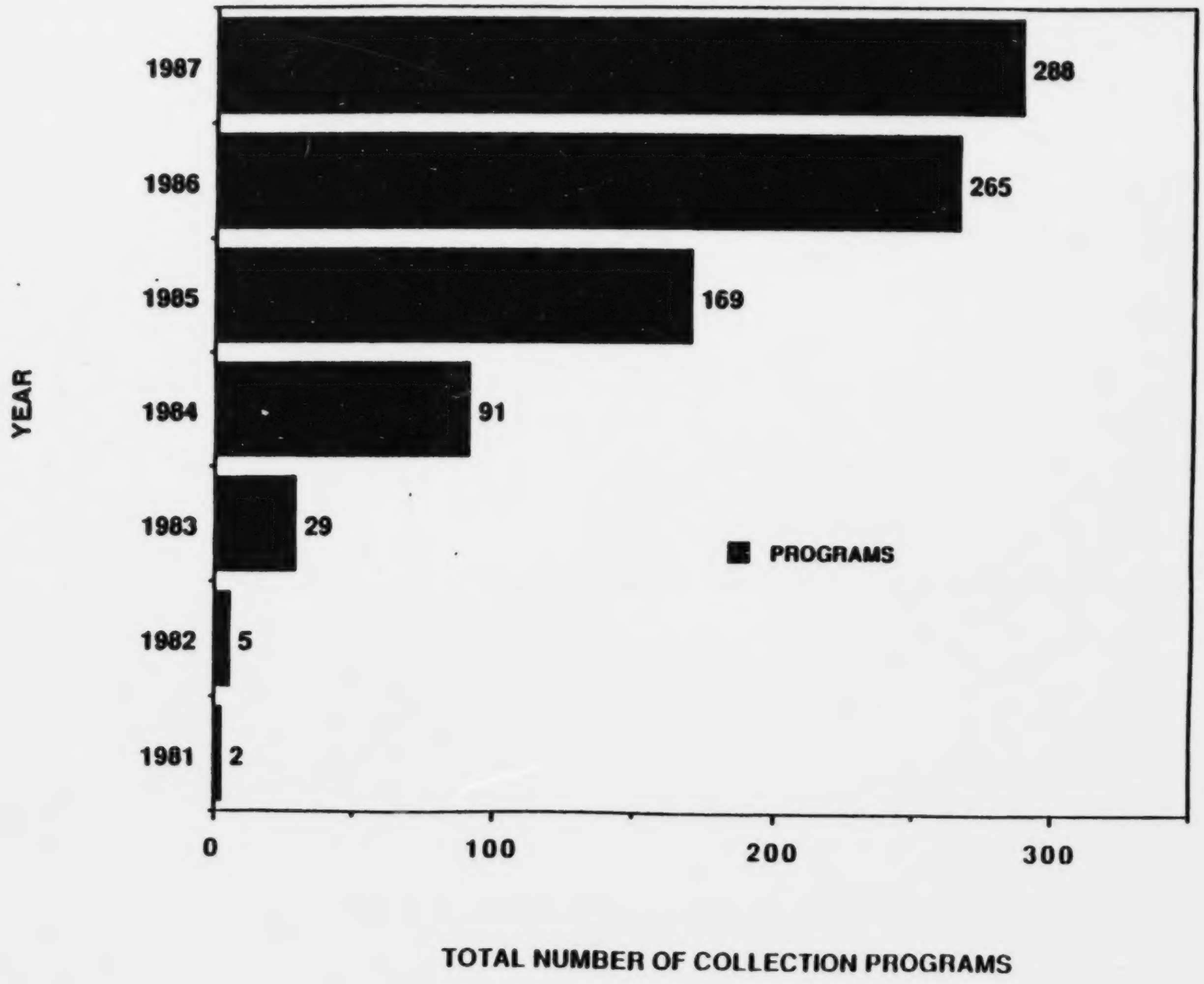
TOTAL NUMBER OF COLLECTION PROGRAMS PER YEAR



HOUSEHOLD HAZARDOUS WASTE
COLLECTION PROGRAMS 1981-1987

Note: Location* indicates permanent program

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | Emelle | 4/20 /85 | Chem Waste Mgt | Gordon Kenna | (205)652-6721 | Chem Waste Mgt | (205)652-6721 | | | 10 |
| Alaska | Anchorage | 5/09 /83 | DEC | Glenn Miller | (907)465-2666 | Chem Securities | | 50000.00 | 5500 gals | [illegible] |
| Alaska | Fairbanks | 5/16 /83 | DEC | Glenn Miller | (907)465-2666 | Chem Waste Mgt | | | | |
| Alaska | Fairbanks | 5/14 /84 | DEC | Glenn Miller | (907)465-2666 | NW Env Srvcs | | | | |
| Alaska | Juneau | 5/19 /84 | DEC | Glenn Miller | (907)465-2666 | NW Env Srvcs | | | | |
| Alaska | Anchorage | Spr. /84 | DEC | Glenn Miller | (907)465-2666 | NW Env Srvcs | | 110000.00 | 9075 gals | |
| Alaska | Fairbanks | Spr. /85 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | 4235 gals | |
| Alaska | Anchorage | Sum. /85 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | 150000.00 | 18150 gals | |
| Alaska | Kenai | Spr. /85 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | 3740 gals | |
| Alaska | Juneau | Sum. /85 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | 3300 gals | |
| Alaska | Fairbanks | Spr. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | | |
| Alaska | Anchorage | Spr. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | 90000.00 | 14960 gals | 300 |
| Alaska | Kenai | Sum. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | | |
| Alaska | Homer | Spr. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | | |
| Alaska | Seward | Sum. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | | |
| Alaska | Juneau | Spr. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | | |
| Alaska | Ketchikan | Spr. /86 | DEC | Glenn Miller | (907)465-2666 | Crosby & Overton | | | | |
| Alaska | Juneau | Spr. /87 | DEC | Glenn Miller | (907)465-2666 | NW Env. Srvcs. | (206)762-1190 | 100000.00 | 51 drums | |
| Alaska | Anchorage | Sum. /87 | DEC | Glenn Miller | (907)465-2666 | NW Env. Srvcs. | (206)762-1160 | | 113 drums | |
| Arizona | Tucson (2 days) | 2/27 /87 | Waste Water Mgmt. | Lois Kulakowski | (602)881-3939 | GSX | (800)251-1227 | 70000.00 | 4400 gals | 350 |
| Arkansas | Little Rock | 6/13 /87 | LWV of Arkansas | Joanne Jackson | (501)376-7760 | ENSCO | (501)223-4100 | 13675.00 | 7000 lbs | 200 |
| California | San Francisco* | PERM. | Cnty:San Francisco | Larry Sweetser | (415)468-2442 | | | | | |
| California | Sacramento | 10 /82 | GENPC,County | Gina Purin | (916)731-5050 | | | 14000.00 | 2970 gals | 250 |
| California | Palo Alto | 10/29 /83 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | Chem Waste Mgt | | 3900.00 | 1650 gals | 70 |
| California | Palo Alto | 11/05 /83 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | Davis | Spr. /83 | Public Works | J.B. Holmquist | (916)666-8775 | | | | | |
| California | Woodland | Sum. /83 | Public Works | J.B. Holmquist | (916)666-8775 | | | | | |
| California | W. Sacramento | Spr. /83 | Public Works | J.B. Holmquist | (916)666-8775 | | | | | |
| California | Redlands | 3/26 /84 | LWV | Joan Dotson | (714)793-1164 | | | 4990.00 | 185 gals | 30 |
| California | San Bernadino | 3/24 /84 | Env Hlth Srvcs | Steve Van Stock | (714)383-3354 | | | | | |
| California | Sacramento | 4 /84 | GENPC,County | Gina Purin | (916)731-5050 | | | 25000.00 | 9075 gals | 900 |
| California | San Diego | 6 /84 | Env Hlth Coalition | Diane Takvorian | (619)235-0281 | | | | | |
| California | Palo Alto | 6/02 /84 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | Chem Waste Mgt | | 6100.00 | 3025 gals | 80 |
| California | Palo Alto | 6/09 /84 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | Oakland | 9/29 /84 | LWV,DHS,City | Joan Patton | (415)775-0683 | | | | | |
| California | Palo Alto | 10/27 /84 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | Irvine | 10/27 /84 | Public Works | Phil Marsch | (714)660-3721 | | | | | |
| California | San Mateo | 10/27 /84 | County | Judy Henley | (415)363-4305 | | | | | |
| California | Palo Alto | 11/03 /84 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | San Diego | Spr. /84 | Env Hlth Coalition | Diane Takvorian | (619)235-0281 | | | 57000.00 | 13626 gals | 290 |
| California | Victorville | 1/12 /85 | Env Hlth Srvcs,Cnty | Doug Frazier | (408)988-1111 | | | | | |
| California | San Bernadino* | 2 /85 | Cnty: San Bernadino | Judy Ortung | (714)387-4629 | Disp Cntrl Srvcs | | | | |
| California | Fontana* | 3. /85 | Cnty: San Bernadino | Judy Ortung | (714)387-4629 | Disp Cntrl Srvcs | | | | |
| California | Albany | 2/24 /85 | City of Albany | William Haden | (415)528-5710 | | | | | |
| California | Contra Costa | 4/13 /85 | Cnty HW Task Force | Kathleen Hier | (415)228-5746 | | | | | |
| California | Richmond | 4/13 /85 | County | Kirsten Ritchie | (415)671-4295 | | | | | |
| California | Santa Rosa | 4/15 /85 | Empire Waste Mgt Co | Dennis McGee | (707)585-0291 | | | | | |
| California | Huntington Beach | 4/20 /85 | County,LWV | Frank Bowerman | (213)834-8892 | | | | | |
| California | Cupertino | 4/27 /85 | City of Cupertino | K. Blackburn | (408)252-4505 | | | | | |
| California | Mountain View | 5/11 /85 | City of Mt. View | Frank Moe | (415)996-6365 | | | | | |
| California | Mountain View | 5/18 /85 | City of Mt. View | Frank Moe | (415)996-6365 | | | | | |
| California | Milpitas | 5/18 /85 | City of Milpitas | Stella Jerome | | | | | | |
| California | Sacramento | 6 /85 | GENPC,County | Gina Purin | (916)731-5050 | | | | | |
| California | Palo Alto | 6/08 /85 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | Santa Rosa | 6/29 /85 | Empire Waste Mgt Co | Dennis McGee | (707)585-0291 | | | | | |

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# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| California | San Francisco | 8/03 /85 | Sanitary Fill Co. | Larry Sweetser | (415)468-2442 | | | | | |
| California | Santa Rosa | 8/17 /85 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | Union City | 9/14 /85 | Oakland Scavenger | John Sheehan | (415)465-2911 | | | | | |
| California | Sacramento | 9/21 /85 | GSWPC,County | Gino Purin | (916)731-5050 | | | | | |
| California | Fremont | 9/21 /85 | Oakland Scavenger | John Sheehan | (415)465-2911 | | | | | |
| California | Sacramento | 9/28 /85 | GSWPC,County | Gino Purin | (916)731-5050 | | | | | |
| California | Hayward | 9/28 /85 | Safety Specialists | Dawn Frasier | (408)988-1111 | | | | | |
| California | Santa Cruz | 9/28 /85 | Safety Specialists | Dawn Frasier | (408)988-1111 | | | | | |
| California | Santa Rosa | 9/28 /85 | Empire Waste Mgt Co | Dennis McGee | (707)585-0291 | | | | | |
| California | Folsom | 10/05 /85 | Safety Specialists | Dawn Frasier | (408)988-1111 | | | | | |
| California | Santa Cruz | 10/05 /85 | Safety Specialists | Dawn Frasier | (408)988-1111 | | | | | |
| California | Santa Cruz | 10/12 /85 | Safety Specialists | Dawn Frasier | (408)988-1111 | | | | | |
| California | Watsonville | 10/12 /85 | Safety Specialists | Dawn Frasier | (408)988-1111 | | | | | |
| California | Woodland | 10/12 /85 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | Palo Alto | 10/16 /85 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | Sunnyvale | 10/19 /85 | | | | | | | | |
| California | Salinas | 10/26 /85 | Safety Spec,Cnty | Arylene Willitzie | (408)758-7382 | | | | | |
| California | Palo Alto | 11/02 /85 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | San Mateo | 11/02 /85 | San Mateo Co. | Peter Burnes | (415)329-2117 | | | | | |
| California | Laguna Niguel | 11/02 /85 | Orange Co. | | | | | | | |
| California | Santa Rosa | 11/16 /85 | Empire Waste Mgt Co | Dennis McGee | (707)585-0291 | | | | | |
| California | Santa Rosa | 1/11 /86 | Empire Waste Mgt | Dennis McGee | (707)585-0291 | | | | | |
| California | San Diego | 3 /86 | Cnty Pub Hlth Srvcs | Ronald Duncan | | Amerec Techs II | | 36165.00 | 5225 gals | 226 |
| California | Ontario | 4/12 /86 | San Bernadino Co | Kenneth Jeske | | | | | | |
| California | Rancho Cucamonga | 4/12 /86 | San Bernadino Co | Kenneth Jeske | | | | | | |
| California | Chino | 4/19 /86 | San Bernadino Co. | Kenneth Jeske | | | | | | |
| California | Upland | 4/19 /86 | San Bernadino Co | Kenneth Jeske | | | | | | |
| California | Montclair | 4/19 /86 | San Bernadino Co. | Kenneth Jeske | | | | | | |
| California | Santa Ana | 4/19 /86 | Orange Co. | Sandra Schafer | | | | | | |
| California | Santa Rosa | 4/21 /86 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | Victorville | 4/24 /86 | San Bernadino Co | Kenneth Jeske | | | | | | |
| California | Palo Alto | 4/26 /86 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | S. San Francisco | 4/26 /86 | San Mateo Cnty | Judy Henley | | | | | | |
| California | San Carlos | 4/26 /86 | San Mateo Cnty | Judy Henley | | | | | | |
| California | San Bernadino | 5/24 /86 | San Bernadino Cnty | Diane Birdsal | | | | | | |
| California | Santa Monica | 5/31 /86 | | | | | | | | |
| California | Palo Alto | 6/07 /86 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | San Rafael | 6/07 /86 | LWV | Kathy Gueldner | | | | | | |
| California | Santa Rosa | 6/14 /86 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | Santa Rosa | 8/09 /86 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | Palo Alto | 8/30 /86 | Water Qual Cntrl | Peter Burnes | (415)329-2117 | | | | | |
| California | Santa Rosa | 10/11 /86 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | Santa Rosa | 10/13 /86 | Empire Environmental | Dennis McGee | (707)585-0291 | | | | | |
| California | San Diego* (?) | 12 /86 | San Diego Cnty | David Harris | (619)235-0281 | Approp Tech II | | | | |
| California | Santa Rosa | 12/13 /86 | Empire Waste Mgt | Dennis McGee | (707)585-0291 | | | | | |
| California | Palo Alto | 1 /87 | City | Rosemary Ralston | (415)329-2522 | Safety Specialists | | | | |
| California | Nevada City | 1 /87 | Cnty of Nevada | Tom Edwards | (916)985-6666 | American Environ. | | | | |
| California | Redlands* | 2 /87 | San Bernadino Cnty | Joan Batson | (714)793-1164 | | | | | |
| California | Victorville* | 2 /87 | Cnty: San Bernadino | Judy Ostrums | (714)387-4629 | Disp Cntrl Srvcs | | | | |
| California | Barstow* | 2 /87 | Cnty: San Bernadino | Judy Ostrums | (714)387-4629 | Disp Cntrl Srvcs | | | | |
| California | Ventura | 3 /87 | Ventura Reg. Sanit. | Mike Adamske | (805)658-4630 | HG Chemical | | | | |
| California | Sacramento Cnty | 4 /87 | Cnty of Sacramento | Janet Zahler | (916)366-2109 | Safety Specialists | | | | |
| California | Nevada Cnty | 4 /87 | Cnty of Nevada | Joe Sosa | (408)988-1111 | Safety Specialists | | | | |
| California | Los Altos | 4 /87 | City of Los Altos | Dalfney Siewert | (415)948-1491 | Bay Area Environ. | | | | |
| California | Citrus Heights | 4 /87 | Cnty of Sacramento | Gina Purin | (916)731-5050 | American Environ. | | | | |

Page No. 3
10/28/87

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST WASTE | FACIL |
|---|---|---|---|---|---|---|---|---|---|
| California | Yucca | 4 /87 | City:Yucca Valley | Judy Orttung | (714)387-4629 | | | | |
| California | Sacramento Cnty | 5 /87 | Cnty of Sacramento | Janet Zahier | (916)366-2109 | Safety Specialists | | | |
| California | Scotts Valley | 5 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Davis | 5 /87 | Yolo Cnty | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Sunnyvale | 5 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Santa Monica | 5 /87 | City of Santa Monica | Jennifer Stone | (213)458-8224 | Disp Cntrl Srvcs | | | |
| California | Santa Barbara | 5 /87 | Cnty of Santa Barb. | Karen Feeney | (805)963-0583 | American Environ. | | | |
| California | Fremont | 5 /87 | | John Ruppel | (415)791-4299 | Chem. Waste Mgt. | | | |
| California | Union City | 5 /87 | | John Ruppel | (415)791-4299 | Chem. Waste Mgt. | | | |
| California | Newark | 5 /87 | | John Ruppel | (415)791-4299 | Chem. Waste Mgt. | | | |
| California | Davis | 5 /87 | Yolo Cnty DPW | J.P. Holmquist | (916)666-8775 | | | | |
| California | Ontario | 5 /87 | City:Ontario | Judy Orttung | (714)387-4629 | | | | |
| California | Chino | 5 /87 | City:Chino | Judy Orttung | (714)387-4629 | | | | |
| California | Upland | 5 /87 | City:Upland | Judy Orttung | (714)387-4629 | | | | |
| California | Morganhill | 6 /87 | City | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Salinas | 6 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Rancho Cucamonga* | 6 /87 | Cnty: San Bernadino | Judy Orttung | (714)387-4629 | Disp Cntrl Srvcs | | | |
| California | Santa Barbara | 6 /87 | Cnty of Santa Barb. | Karen Feeney | (805)963-0583 | American Environ. | | | |
| California | Livermore | 6 /87 | | Dave Adams | (415)449-4000 | Chem. Waste Mgt. | | | |
| California | Pleasanton | 6 /87 | | Dave Adams | (415)449-4000 | Chem. Waste Mgt. | | | |
| California | Dublin | 6 /87 | | Dave Adams | (415)449-4000 | Chem. Waste Mgt. | | | |
| California | Palo Alto | 7 /87 | City | Rosemary Ralston | (415)329-2522 | Safety Specialists | | | |
| California | Milpitas | 7 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Cupertino | 7 /87 | City of Cupertino | Steve Sano | (408)252-4505 | Bay Area Environ. | | | |
| California | Vallejo | 7 /87 | City of Vallejo | Jim Walsh | (707)552-3110 | Vallejo Garbage Co | | | |
| California | St. Helena | 7 /87 | City of St. Helena | Jim Walsh | (707)552-3110 | Vallejo Garbage Co | | | |
| California | Berkeley | 7 /87 | Alameda Cnty | Vince Spencer | (415)644-6510 | Chem. Waste Mgt. | | | |
| California | Emeryville | 7 /87 | Alameda Cnty | Vince Spencer | (415)644-6510 | Chem. Waste Mgt. | | | |
| California | Albany | 7 /87 | Alameda Cnty | Vince Spencer | (415)644-6510 | Chem. Waste Mgt. | | | |
| California | San Leandro | 7 /87 | Cnty of Alamedia | Amy Meiorin | (415)464-7961 | | | | |
| California | San Lorenzo | 7 /87 | Cnty of Alamedia | Amy Meiorin | (415)464-7961 | | | | |
| California | Santa Rosa | 8 /87 | City of Santa Rosa | Tony Santos | (415)770-0575 | Chem Waste | | | |
| California | Truckee | 8 /87 | Cnty of Nevada | Tom Edwards | (916)985-6666 | American Environ. | | | |
| California | Napa | 8 /87 | City of Napa | Jim Walsh | (707)552-3110 | Vallejo Garbage Co | | | |
| California | Sacramento Cnty | 9 /87 | Cnty of Sacramento | Janet Zahier | (916)366-2109 | Safety Specialists | | | |
| California | Nevada Cnty | 9 /87 | Cnty of Nevada | Joe Sosa | (408)988-1111 | Safety Specialists | | | |
| California | Haywood | 9 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Hayward | 9 /87 | | Hugh Murphy | (415)784-8690 | Chem. Waste Mgt. | | | |
| California | Castro Valley | 9 /87 | | Hugh Murphy | (415)784-8690 | Chem. Waste Mgt. | | | |
| California | Mendocino | 9 /87 | Cnty of Mendocino | Randy Leach | (707)463-4461 | | | | |
| California | Sacramento Cnty | 10 /87 | Cnty of Sacramento | Janet Zahier | (916)366-2109 | Safety Specialists | | | |
| California | Sunnyvale | 10 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Santa Clara | 10 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Mountain View | 10 /87 | | Joe Sosa | (408)988-1111 | Safety Specialists | (408)988-1111 | | |
| California | Glendale | 10 /87 | City of Glendale | Steve Adams | (818)956-4844 | American Environ. | | | |
| California | Petaluma | 10 /87 | City of Petaluma | Tony Santos | (415)770-0575 | Chem Waste | | | |
| California | Fresno | 10 /87 | LWV | Bette Noblett | (209)439-2867 | Safety Specialists | | | |
| California | Santa Barbara | 10 /87 | Cnty of Santa Barb. | Karen Feeney | (805)963-0583 | American Environ. | | | |
| California | Woodland | 10 /87 | Yolo Cnty DPW | J.B. Holmquist | (916)666-8775 | | | | |
| California | Riverside Cnty | 10 /87 | Cnty:Riverside | Rose Hrinko | (714)369-4335 | Disp Cntrl Srvcs | | | |
| California | Irvine | 11 /87 | City of Irvine | Katherine Obitz | (714)857-0124 | Waste Mgt. | | | |
| California | Oxnard | 11 /87 | Ventura Reg. Sanit. | Mike Adamske | (805)658-4630 | MG Chemical | | | |
| California | Santa Barbara | 11 /87 | Cnty of Santa Barb. | Karen Feeney | (805)963-0583 | American Environ. | | | |
| California | Kings Cnty | 11 /87 | Cnty DPW | | | | | | |
| California | San Jose | 11 /87 | City:San Jose | Richard Gertman | (408)277-4509 | | | | |

Page No. 4
10/28/87

## HOUSEHOLD HAZARDOUS WASTE
## COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| California | Monterey Cnty (2) | Sep. /87 | | Joe Soos | (408)988-1111 | Safety Specialists | (408)988-1111 | | | |
| California | Orange Cnty | Sep. /87 | Cnty of Orange | Jindy Shaefer | (714)744-0566 | | | | | |
| California | Solano | Sep. /87 | Cnty of Solano | Jim Walsh | (707)552-3110 | | | | | |
| California | Lompoc | Sep. /87 | City of Lompoc | | | American Environ. | (714)826-6330 | | | |
| California | Monterey Cnty (2) | Fall /87 | | Joe Soos | (408)988-1111 | Safety Specialists | (408)988-1111 | | | |
| California | Orange Cnty | Fall /87 | Cnty of Orange | Sandy Shaefer | (714)744-0566 | | | | | |
| California | Solano | Fall /87 | Cnty of Solano | Jim Walsh | (707)552-3110 | | | | | |
| Colorado | Aurora | 10/13 /84 | Tri-County Hlth Dept | Bruce Wilson | (303)761-1340 | Cocos | (303)341-9370 | | | |
| Colorado | Commerce City | 10/13 /84 | Tri-County Hlth Dept | Bruce Wilson | (303)761-1340 | Cocos | (303)341-9370 | | | |
| Colorado | Littleton | 10/13 /84 | Tri-Cnty Hlth Dept | Bruce Wilson | (303)761-1340 | Cocos | (303)341-9370 | 20000.00 | 3025 gals | 358 |
| Colorado | Tomkins | Fall /84 | | | (607)274-5360 | GSX Services | | 4460.00 | 990 gals | 109 |
| Colorado | Larimer Cnty | 9/30 /85 | County | Janelle Henderson | (303)221-7496 | GSX Services | (800)251-1227 | 29372.00 | 3690 gals | 285 |
| Connecticut | Ridgefield | 6/23 /84 | Ridgefield | Lillian Willis | (203)438-8653 | Radiac Research | | 5000.00 | 306 gals.<br>515 lbs | 75 |
| Connecticut | Mansfield | 4/20 /85 | Mansfield | Chuck Vinsonhaler | (203)423-2150 | Radiac Research | | 11000.00 | 2675 gals | 100 |
| Connecticut | Westport/Weston | 6/08 /85 | Weston/Westport | Helen Seech | (203)222-2656 | Radiac Research | | 10390.00 | 770 gals.<br>657 lbs | 300+ |
| Connecticut | Greenwich | 7/13 /85 | Greenwich | Bob Brown | (203)622-6480 | Radiac Research | | 8750.00 | 550 gals.<br>242 lbs | 125 |
| Connecticut | Wilton | 10/19 /85 | Ridgefield/Wilton | Lillian Willis | (203)481-8653 | Radiac Research | | 16324.00 | 556 gals.<br>701 lbs | 200+ |
| Connecticut | Manchester | 10/19 /85 | Manchester | Art Glasser | (203)649-4453 | Radiac Research | | 8000.00 | 204 gals.<br>290 lbs | 11 |
| Connecticut | Farmington | 10/26 /85 | Farmington | Steve Kushner | (203)673-8221 | Radiac Research | | 14000.00 | 249 gals.<br>425 lbs | 125 |
| Connecticut | Killingly | 11 16 /85 | NE CT Reg Plan Agncy | Gerald McCarthy | (203)774-1253 | McDonald & Watson | | 7037.00 | 575 gals.<br>2658 lbs | 115 |
| Connecticut | Southington | 11/02 /85 | Southington | Madeline Brunelli | | McDonald & Watson | | 7600.00 | 3100 gals.<br>716 lbs | 215+ |
| Connecticut | Salisbury/Sharon | 11/02 /85 | Salisbury/Sharon | Victoria Givotovsky | (203)453-9091 | Radiac Research | | 14000.00 | 208 gals.<br>682 lbs | 111+ |
| Connecticut | East Lyme | 4/12 /86 | East Lyme | George Calkins | (203)739-5401 | McDonald & Watson | | 5804.50 | 92 gals.<br>1250 lbs | 65+ |
| Connecticut | Windsor | 4/12 /86 | Windsor | Mark Sussman | (203)549-4500 | McDonald & Watson | | 9392.00 | 770 gals.<br>4230 lbs | 265 |
| Connecticut | North Haven | 4/26 /86 | Town | Rosabert Pfeiffer | (203)239-3361 | McDonald & Watson | | 9002.00 | 320 gals.<br>5364 lbs | 140 |
| Connecticut | Barkhamsted | 4/26 /86 | Reg Refuse Disp Dist | Jim Hart | (203)379-1072 | Radiac Research | | 20050.00 | 1087 gals.<br>1308 lbs | 115 |
| Connecticut | Saybrook | 5/03 /86 | CT River (CTRERPA) | Stan Greimann | (203)388-3497 | McDonald & Watson | | 11255.00 | 555 gals.<br>27831 lbs | 227 |
| Connecticut | W. Hartford | 5/03 /86 | W. Hartford | Ed O'Leary | (203)236-3231 | NE Solvents | (617)603-1002 | 266.00 | 517 gals.<br>356 lbs | 300+ |
| Connecticut | New Milford | 5/10 /86 | County | Lynn Werner | (203)672-6670 | McDonald & Watson | | 16064.00 | 10235 gals.<br>17701 lb | 250+ |
| Connecticut | Redding/Easton | 5/17 /86 | Redding/Easton | Maryann Guitar | (203)438-2002 | McDonald & Watson | | 14000.00 | 410 gals.<br>2995 lbs | 170 |
| Connecticut | Bristol/Burlington | 5/17 /86 | City | Alan Conrad | (203)584-7645 | CECOS | | 8000.00 | 415 gals | 110 |
| Connecticut | Cheshire | 5/17 /86 | Town | Richard Pluer | (203)272-3501 | Radiac Research | | 10165.00 | 296 gals.<br>2719 lbs | 107 |
| Connecticut | Bethel/Brookfield | 5/31 /86 | HVCEO | Rich Lynn | (203)775-6256 | McDonald & Watson | | 14000.00 | 1377 gals.<br>6276 lbs | 250 |
| Connecticut | Wethersfield | 6/07 /86 | Wethersfld Hlth Dept | Paul Hutcheon | (203)529-8611 | GSX Services | | 10050.00 | 170 gals.<br>111 lbs | 105 |

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Connecticut | Fairfield | 6/14 /86 | Fairfield Fire Dept | St. William Kessler | (203)222-4527 | McDonald & Watson | | 9622.00 | 460 gals.<br>1000 lbs | 150 |
| Connecticut | Granby | 6/14 /86 | Town of Granby | Paula Hudson | (203)653-7385 | ME Solvents | (617)683-1002 | 16850.00 | 209 gals.<br>315 lbs | 160 |
| Connecticut | Avon/Canton | 9/13 /86 | Avon | Hudson Birden | (203)677-2634 | McDonald & Watson | | 14000.00 | 625 gals.<br>6075 lbs | 160 |
| Connecticut | Plainville | 9/27 /86 | Town | Bob Finn | (203)793-0221 | Radiac Research | | 14975.00 | 455 gals.<br>2500 lbs | 85+ |
| Connecticut | Weston | 10/04 /86 | Town | Helen Sneck | (203)222-2656 | McDonald & Watson | | 10000.00 | 385 gals.<br>1770 lbs | 170 |
| Connecticut | Southington | 10/11 /86 | Conservation Comm. | Norm Van Cor | | McDonald & Watson | | 12000.00 | 2080 gals.<br>960 lbs | 220 |
| Connecticut | Milford/Orange | 10/18 /86 | Milford Cons. Comm. | Bartley Block | | McDonald & Watson | | 14892.00 | 355 gals.<br>1450 lbs | 170 |
| Connecticut | Branford | 10/18 /86 | E Shore Hlth Dept | Dennis Johnson | (203)481-4233 | McDonald & Watson | | 145000.00 | 575 gals.<br>2850 lbs | 200 |
| Connecticut | Farmington | 10/18 /86 | Town | Steve Kushner | (203)673-8221 | Radiac Research | | 14000.00 | 1105 gals.<br>1400 lbs | 110 |
| Connecticut | Guilford/Madison | 10/19 /86 | Town | Ginny Pero | (203)457-1153 | McDonald & Watson | | 13777.00 | 465 gals.<br>4100 lbs | 210+ |
| Connecticut | Danbury | 10/25 /86 | Town | Jack Kozuchowski | (203)797-4625 | McDonald & Watson | | 10000.00 | 865 gals.<br>2550 lbs | 100 |
| Connecticut | Middletown | 11/01 /86 | Midstate RPA | Sondra King | (203)347-7214 | McDonald & Watson | | 13700.00 | 580 gals.<br>980 lbs | 202+ |
| Connecticut | Groton | 11/08 /86 | Town | Robert Hust | (203)445-8551 | McDonald & Watson | | 12235.00 | 1995 gals.<br>450 lbs | 150 |
| Connecticut | New Haven | 4/25 /87 | Town | Susan Whetstone | (203)787-8278 | Radiac Research | | 13000.00 | 560 gals.<br>290 lbs | 100 |
| Connecticut | North Haven | 4/25 /87 | Town | Al Cretella | (203)239-2186 | McDonald & Watson | | 14000.00 | 620 gals.<br>3950 lbs | 214 |
| Connecticut | Windsor | 4/25 /87 | Town | Micki Mattei | (203)529-8611 | McDonald & Watson | | 12467.00 | 1480 gals.<br>880 lbs | 275 |
| Connecticut | Woodbury/Southbury | 5/02 /87 | Hlth Dist | Tim Callahan | (203)266-4785 | ME Solvents | | 20000.00 | 680 gals.<br>8760 lbs | 368 |
| Connecticut | Ridgefield//Wilton | 5/02 /87 | Town | Lillian Willis | (203)438-8653 | Radiac Research | | 25000.00 | 1615 gals.<br>220 lbs | 301 |
| Connecticut | Norwalk | 5/09 /87 | Public Works | Dominic DiGenni | (203)854-7791 | Radiac Research | | 30000.00 | 1225 gals.<br>516 lbs | 250 |
| Connecticut | Mansfield/Coventry | 5/16 /87 | Public Works | Steve Bowen | (203)429-3340 | Radiac Research | | 10000.00 | 30 gals.<br>250 lbs | 90 |
| Connecticut | CT River | 5/16 /87 | CTRERPA | Stan Greimann | (203)388-3497 | McDonald & Watson | | 13000.00 | 1164 gals.<br>1087 lbs | 190 |
| Connecticut | Wallingford | 5/16 /87 | Town | Rep. Mary Mushinsky | (203)269-8378 | ME Solvents | | 22000.00 | 1300 gals.<br>12175 lbs | 107 |
| Connecticut | Suffield | 6/06 /87 | Town | Dr. Fred Brockett | (203)668-7397 | McDonald & Watson | | 12000.00 | 715 gals.<br>1005 lbs | 170 |
| Connecticut | Waterford/New Lond | 6/06 /87 | Public Works | Ed Steward | (203)444-5864 | ME Solvents | | 20000.00 | 1140 gals.<br>1870 lbs | 250 |
| Connecticut | Hamden | 9/12 /87 | | | | | | | | 176 |
| Connecticut | Southington | 9/12 /87 | | | | McDonald & Watson | | 12000.00 | | 258 |
| Connecticut | Stamford | 9/19 /87 | | Marvin Serra | | McDonald & Watson | | 29500.00 | | 470 |
| Connecticut | N. Branford | 9/26 /87 | | Mary Bigelow | (203)481-6430 | ME Solvents | (617)683-1002 | 4720.00 | 12 drums | 45 |
| Connecticut | Greenwich | 9/26 /87 | | | | Radiac | | | | 770 |
| Connecticut | E. Hartford | 10/10 /87 | | Richard Toce | (203)289-2781 | ME Solvents | (617)683-1002 | 1600.00 | 20 drums | 10 |
| Connecticut | Westport | 10/17 /87 | | Helen Sneck | (203)222-2656 | McDonald & Watson | | | | |

Page No. 6
10/28/87

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Connecticut | W. Hartford | 10/17 /87 | | Ed O'Leary | (203)523-5203 | NE Solvents | (617)683-1002 | 16000.00 | 51 drm | |
| Connecticut | Ledyard | 10/17 /87 | | Joyce Rowley | (203)464-8740 | NE Solvents | (617)683-1002 | 8100.00 | 16 drms | |
| Connecticut | Litchfield | 10/24 /87 | Regional | | | McDonald & Watson | (401)946-0200 | | | 6.5 |
| Connecticut | Woodstock | 10/31 /87 | Regional | | | McDonald & Watson | (401)946-0200 | | | |
| Connecticut | Fairfield | 11/07 /87 | | | | | | | | |
| Connecticut | Wethersfield | 11/07 /87 | | | | McDonald & Watson | (401)946-0200 | | | |
| Delaware | Wilmington | 6/20 /87 | Hercules Inc | T.J. Wender | (302)594-5000 | Rollins Env | (215)358-5550 | 16500.00 | 4000 lbs | 160 |
| Florida | Dade Cnty | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 54982 lbs | 619 |
| Florida | Broward Cnty | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 56982 lbs | 679 |
| Florida | Monroe Cnty | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 2604 lbs | 17 |
| Florida | Manatee Cnty | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 17282 lbs | 116 |
| Florida | Hillsborough Cnty | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 35744 lbs | 293 |
| Florida | Pinellas Cnty | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 55480 lbs | 1100 |
| Florida | New Port Richey | Spr. /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 6340 lbs | 210 |
| Florida | Brevard Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 33110 lbs | 456 |
| Florida | Orange Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 65508 lbs | 673 |
| Florida | Osceola Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 9679 lbs | 143 |
| Florida | Lake Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 16160 lbs | 177 |
| Florida | Seminole Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 13179 lbs | 162 |
| Florida | Volusia Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 17785 lbs | 197 |
| Florida | Putnam Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 6620 lbs | 46 |
| Florida | St. John's Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 8184 lbs | 52 |
| Florida | Flagler Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 1377 lbs | 22 |
| Florida | Baker Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 658 lbs | 11 |
| Florida | Duval Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 61749 lbs | 381 |
| Florida | Clay Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 17929 lbs | 151 |
| Florida | Nassau Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 9557 lbs | 56 |
| Florida | Alachua Cnty | Fall /84 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 91640 lbs | 982 |
| Florida | Escambia Cnty | Spr. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 33195 lbs | 109 |
| Florida | Okaloosa Cnty | Spr. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 29419 lbs | 201 |
| Florida | Santa Rosa Cnty | Spr. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 9450 lbs | 20 |
| Florida | Walton Cnty | Spr. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 4145 lbs | 23 |
| Florida | Bay Cnty | Spr. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 18005 lbs | 130 |
| Florida | Holmes Cnty | Sec. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 3300 lbs | 11 |
| Florida | Washington Cnty | Spr. /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 3030 lbs | 14 |
| Florida | St. Lucie Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 20712 lbs | 160 |
| Florida | Indian River Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 34739 lbs | 146 |
| Florida | Martin Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 31691 lbs | 243 |
| Florida | Palm Beach (3) | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 194921 lbs | 513 |
| Florida | Collier Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 26343 lbs | 164 |
| Florida | Hendry Cnty (2) | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 8226 lbs | 26 |
| Florida | Lee Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 77632 lbs | 484 |
| Florida | Glades Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 200 lbs | 6 |
| Florida | Charlotte Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 30365 lbs | 281 |
| Florida | Sarasota Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 87413 lbs | 700 |
| Florida | DeSoto Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 4403 lbs | 76 |
| Florida | Hardee Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 7600 lbs | 18 |
| Florida | Okeechobee Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 4433 lbs | 74 |
| Florida | Highlands Cnty | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 15222 lbs | 90 |
| Florida | Polk Cnty (2) | Fall /85 | DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 106418 lbs | 711 |
| Florida | Alachua Cnty | 3/19 /86 | County | Vince McLeod | (904)373-0509 | Chem Waste M-t | | 68165.00 | 101182 lbs | 700 |
| Florida | Hernando Cnty | 10/01 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 37475 lbs | 118 |
| Florida | Sumter Cnty | 10/03 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 20432 lbs | [illegible] |
| Florida | Levy Cnty | 10/07 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | 6467 lbs | [illegible] |
| Florida | Citrus Cnty | 10/08 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSE Services | (800)334-5953 | | [illegible] | [illegible] |

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Florida | Bradford | 10/10 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | [illegible] | [illegible] |
| Florida | Marion | 10/14 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | [illegible] | [illegible] |
| Florida | Union | 10/14 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 3946 lbs | 9 |
| Florida | Dixie | 10/16 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 1300 lbs | 18 |
| Florida | Lafayette | 10/18 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 250 lbs | 2 |
| Florida | Suwannee | 10/20 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 5600 lbs | 25 |
| Florida | Columbia | 10/22 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 10700 lbs | 81 |
| Florida | Hamilton | 10/23 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 762 lbs | 6 |
| Florida | Gilchrist | 10/25 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 4017 lbs | 19 |
| Florida | Madison | 10/28 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 5348 lbs | 26 |
| Florida | Taylor | 10/31 /86 | Florida DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 4998 lbs | 15 |
| Florida | Palm Beach Cnty | 2/27 /87 | Solid Waste Auth | Donna Deis | (305)471-5770 | Chem Waste Mgt | (415)651-2964 | | | |
| Florida | Martin Cnty | 3/06 /87 | Env Srvcs | Marilyn Cary | (305)288-5700 | Chem Waste Mgt | (415)651-2964 | | 18370 lbs | |
| Florida | Palm Beach Cnty | 3/06 /87 | Solid Waste Auth | Donna Deis | (305)471-5770 | Chem Waste Mgt | (415)651-2964 | | | 225 |
| Florida | Palm Beach Cnty | 3/14 /87 | Solid Waste Auth | Donna Deis | (305)471-5770 | Chem Waste Mgt | (415)651-2964 | | | |
| Florida | Leon Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 43686 lbs | 467 |
| Florida | Jefferson Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 5012 lbs | 39 |
| Florida | Wakulla Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 1000 lbs | 10 |
| Florida | Franklin Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 2265 lbs | 5 |
| Florida | Liberty Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 1356 lbs | 4 |
| Florida | Jackson Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 19201 lbs | 77 |
| Florida | Calhoun Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 3773 lbs | 21 |
| Florida | Gadsden Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 7660 lbs | 44 |
| Florida | Gulf Cnty | Spr. /87 | DER | Jan Kleman | (904)488-0300 | GSX Services | (800)334-5953 | | 2287 lbs | 11 |
| Hawaii | Honolulu | 8/09 /86 | State | Letitia Uyehara | (808)546-6915 | Unitek Env Srvcs | | | 1,650 gals | 240 |
| Hawaii | 5 Islands | 9 /87 | Env Qual Cntrl | George Brosky | (808)548-6915 | Unitek Env Srvcs | (808)834-1444 | 56000.00 | 12471 lbs | |
| Hawaii | 6 Islands | Fall /87 | Env Qual Cntrl | George Brosky | (808)548-6915 | Unitek Env Srvcs | (808)834-1444 | | | |
| Illinois | City of Champaign | 9/13 /87 | City of Champaign | Sam Chandler | (217)351-4443 | GSX | (800)251-1227 | 65000.00 | 10340 gals | 296 |
| Indiana | Zionsville | 9/01 /85 | Zionsville Town Bd. | Mary Jo Bradley | (317)769-4195 | GSX | (800)251-1227 | 8700.00 | 715 gals | 80 |
| Indiana | Indianapolis | 9/20 /85 | City | | | GSX Services | (800)251-1227 | | | |
| Indiana | Indianapolis | 11/15 /86 | DPW | Sara Gues | (317)236-5353 | Process Eng. Group | (317)243-0812 | 60000.00 | 2885 gals | 225 |
| Indiana | Indianapolis | 5/16 /87 | DPW | Sara Gues | (317)236-5353 | Process Eng. Group | (317)243-0812 | 60000.00 | 4680 gals | 344 |
| Indiana | Indianapolis | 10/10 /87 | DPW/Clean City Comm. | Bryan Duncan | (317)236-3606 | Process Eng. Group | (317)243-0812 | 60000.00 | | 160 |
| Iowa | Dubuque Cnty | 9/20 /86 | Dept of Nat Res | John Seyb | (515)281-4076 | AC Industry | (916)343-5488 | 23595.00 | | 195 |
| Iowa | Linn Cnty | 9/20 /86 | Dept of Nat Res | John Seyb | (515)281-4076 | AC Industry | (916)343-5488 | 38357.00 | | 117 |
| Kansas | Great Bend/Wichita | 11/07 /86 | KS Dept of Hlth/Env | Tom Gross | (913)296-1603 | GSX Services | (800)251-1227 | 29838.00 | 7388 lbs | 77 |
| Kansas | Topeka | 11/10 /86 | KS Dept of Hlth/Env | Tom Gross | (913)296-1603 | GSX Services | (800)251-1227 | 6716.00 | 2397 lbs | |
| Kansas | Wichita/Sedgwick | 11/12 /86 | KS Dept of Hlth/Env | Tom Gross | (316)296-1603 | GSX Services | (800)251-1227 | 92726.00 | 35435 lbs | 411 |
| Kentucky | Lancaster | 9 - /81 | W. Bluegrass Dist. | Randall Carrier | (606)792-2462 | Cecos | (513)724-6114 | 300.00 | 330 gals | 50 |
| Kentucky | Lebanon | Spr. /81 | Marion County | Keith Brock | (502)692-3363 | | | 1200.00 | 1900 lbs | |
| Kentucky | Lancaster | 10 /83 | W. Bluegrass Dist. | Randall Carrier | (606)792-2462 | Cecos | (513)724-6114 | 600.00 | 330 gals | 125 |
| Louisiana | Baton Rouge (4) | 10/26 /85 | Env Cntrl/Dow | Chas. Goldsmith | (504)389-6407 | Dow Chemical | (504)389-6407 | 22000.00 | 6500 lbs | |
| Louisiana | Baton Rouge (6) | 5/03 /86 | Dow Chemical Co. | Chas. Goldsmith | (504)389-6407 | Dow Chemical | (504)389-6407 | 23559.00 | 16000 lbs | 176 |
| Louisiana | Baton Rouge (5) | 6/27 /87 | Dow Chemical Co. | Dean Smith | (504)389-1630 | Dow Chemical | (504)389-1630 | 42200.00 | 15720 lbs | 244 |
| Maine | Central/Southern | Fall /84 | Pesticide Cntrl | Henry Jennings | (207)289-2731 | Poll Cntrl Unltd. | | 35000.00 | 9 tons | |
| Maine | Central/Southern | Spr. /86 | Pesticide Cntrl | Henry Jennings | (207)289-2731 | Clean Harbors | (617)849-1800 | 23685.00 | 6 tons | 91 |
| Maryland | Laurel | Fall /85 | GSX Services | Paul Marshall | (800)638-4440 | GSX Services | (800)638-4440 | | | |
| Maryland | Montgomery County | 9/13 /87 | Solid Waste Division | Alan Bernsten | (301)840-2370 | GSX | (301)953-9581 | 94000.00 | 17215 gals | 670 |
| Massachusetts | Lexington | 10/30 /82 | LWV/Hlth Dept | | | Clean Harbors | (617)655-8863 | 1600.00 | 770 gals | 93 |
| Massachusetts | Andover | 5/07 /83 | Board of Health | | | Clean Harbors | (617)655-8863 | 840.00 | 305 gals | 65 |
| Massachusetts | Bedford | 5/14 /83 | Board of Health | | | Clean Harbors | (617)655-8863 | 1160.00 | 610 gals | [illegible] |
| Massachusetts | Wellesley | 5/14 /83 | | | | Clean Harbors | (617)655-8863 | [illegible] | [illegible] | [illegible] |
| Massachusetts | Braintree | 5/21 /83 | SCA Services | | | Clean Harbors | (617)655-8863 | | 900 gal | [illegible] |
| Massachusetts | Fall River | 6/11 /83 | Chamber of Commerce | | | Clean Harbors | (617)655-8863 | 1000.00 | [illegible] | [illegible] |
| Massachusetts | Plymouth | 9/21 /83 | Town | | | Clean Harbors | (617)655-8863 | [illegible] | [illegible] | [illegible] |

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## HOUSEHOLD HAZARDOUS WASTE
## COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Massachusetts | Sudbury | 10/15 /83 | Public Health Dept |  |  | Clean Harbors | (617)655-0863 | 1300.00 | [illegible] gals | [illegible] |
| Massachusetts | Reading | 10/22 /83 | Town |  |  | Clean Harbors | (617)655-0863 | 2950.00 | [illegible] gals | [illegible] |
| Massachusetts | Lexington | 10/22 /83 | Town |  |  | Clean Harbors | (617)655-0863 | 2400.00 | 1430 gals | [illegible] |
| Massachusetts | Concord | 10/29 /83 | Town |  |  | Clean Harbors | (617)655-0863 | 1755.00 | 895 gals | 100 |
| Massachusetts | Bedford | 10/29 /83 | Town |  |  | Clean Harbors | (617)655-0863 | 1100.00 | 464 gals | 80 |
| Massachusetts | Westford | 11/05 /83 | Town |  |  | Clean Harbors | (617)655-0863 | 3056.00 | 1705 gals |  |
| Massachusetts | Dartmouth | 11/05 /83 | Town |  |  | Clean Harbors | (617)655-0863 | 2390.00 | 920 gals | [illegible] |
| Massachusetts | Cape Cod | 11/08 /83 |  |  |  | Clean Harbors | (617)655-0863 | 13300.00 | 8345 gals | 650 |
| Massachusetts | Oxford | 4/07 /84 |  |  |  | Clean Harbors | (617)655-0863 | 1175.00 | 385 gals |  |
| Massachusetts | Amherst | 4/14 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2097.00 | 1135 gals |  |
| Massachusetts | Easthampton | 4/28 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2681.00 | 1160 gals |  |
| Massachusetts | Northampton | 4/28 /84 |  |  |  | Clean Harbors | (617)655-0863 | 4456.00 | 1661 gals |  |
| Massachusetts | Norwood | 5/05 /84 |  |  |  | Clean Harbors | (617)655-0863 | 3224.00 | 1290 gals |  |
| Massachusetts | Acton | 5/05 /84 |  |  |  | Clean Harbors | (617)655-0863 | 3097.00 | 1335 gals |  |
| Massachusetts | Belmont | 5/12 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2106.00 | 884 gals |  |
| Massachusetts | Westport | 5/12 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2505.00 | 1100 gals |  |
| Massachusetts | Easton | 5/12 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2000.00 | 732 gals |  |
| Massachusetts | Worcester | 5/12 /84 |  |  |  | Clean Harbors | (617)655-0863 | 6500.00 | 2690 gals |  |
| Massachusetts | Bedford | 6/02 /84 |  |  |  | Clean Harbors | (617)655-0863 | 1705.00 | 600 gals |  |
| Massachusetts | Plymouth | 6/09 /84 |  |  |  | Clean Harbors | (617)655-0863 | 3048.00 | 823 gals |  |
| Massachusetts | Nantucket | 8/29 /84 |  |  |  | Clean Harbors | (617)655-0863 | 3875.00 | 1345 gals |  |
| Massachusetts | Concord | 9/15 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2970.00 | 1142 gals |  |
| Massachusetts | Duxbury | 9/15 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2745.00 | 1503 gals |  |
| Massachusetts | Andover | 9/22 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2741.00 | 1080 gals | 120 |
| Massachusetts | Cohasset | 9/22 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2457.00 | 990 gals |  |
| Massachusetts | Tewksbury | 9/29 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2095.00 | 835 gals |  |
| Massachusetts | Lincoln | 9/29 /84 |  |  |  | Clean Harbors | (617)655-0863 | 4844.00 | 2015 gals |  |
| Massachusetts | Cape Cod | 10/06 /84 |  |  |  | Clean Harbors | (617)655-0863 | 18000.00 | 4420 gals |  |
| Massachusetts | Sudbury | 10/13 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2946.00 | 1240 gals |  |
| Massachusetts | Gloucester | 10/13 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2100.00 | 705 gals |  |
| Massachusetts | Pepperell | 10/20 /84 |  |  |  | Clean Harbors | (617)655-0863 | 1064.00 | 600 gals |  |
| Massachusetts | Medfield | 10/20 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2214.00 | 1090 gals |  |
| Massachusetts | Lexington | 10/20 /84 |  |  |  | Clean Harbors | (617)655-0863 | 3424.00 | 1435 gals | 150 |
| Massachusetts | Westwood | 10/27 /84 |  |  |  | Clean Harbors | (617)655-0863 | 5600.00 | 2326 gals | 162 |
| Massachusetts | Townsend | 10/27 /84 |  |  |  | Clean Harbors | (617)655-0863 | 1447.00 | 510 gals |  |
| Massachusetts | N. Reading | 10/27 /84 |  |  |  | Clean Harbors | (617)655-0863 | 2368.00 | 755 gals | 32 |
| Massachusetts | Wellesley | 11/03 /84 |  |  |  | Clean Harbors | (617)655-0863 | 3747.00 | 1457 gals | 168 |
| Massachusetts | Sharon | 11/03 /84 |  |  |  | Clean Harbors | (617)655-0863 | 6144.00 | 2995 gals |  |
| Massachusetts | Plymouth | 11/17 /84 |  |  |  | Clean Harbors | (617)655-0863 | 1914.00 | 775 gals |  |
| Massachusetts | Canton | 4/13 /85 | Board of Health |  | (617)828-0615 | Inland Poll Cntrl | (617)843-7110 | 4100.00 | 805 gals |  |
| Massachusetts | Braintree | 9/14 /85 |  |  |  | Clean Harbors | (617)655-0863 |  |  |  |
| Massachusetts | Amherst | 9/21 /85 |  |  |  | Clean Harbors | (617)655-0863 | 5950.00 | 1030 gals |  |
| Massachusetts | Chelmsford | 9/28 /85 |  |  |  |  |  |  |  |  |
| Massachusetts | Bedford | 9/28 /85 |  |  |  |  |  |  |  |  |
| Massachusetts | Needham | 10/05 /85 |  |  |  | Clean Harbors | (617)655-0863 | 7550.00 | 1925 gals |  |
| Massachusetts | Kingston | 10/05 /85 |  |  |  | Clean Harbors | (617)655-0863 |  |  |  |
| Massachusetts | Marthas Vineyard | 10/05 /85 |  | Kate Gass | (617)693-3479 | Inland Poll Cntrl | (617)843-7110 | 16661.00 | 1870 gals |  |
| Massachusetts | Concord | 10/05 /85 |  |  |  |  |  |  |  |  |
| Massachusetts | Carlisle | 10/05 /85 |  |  |  | Clean Harbors | (617)655-0863 |  |  |  |
| Massachusetts | Lincoln | 10/12 /85 |  |  |  | Clean Harbors | (617)655-0863 | 7000.00 | 1525 gals |  |
| Massachusetts | Acton | 10/12 /85 |  |  |  | Clean Harbors | (617)655-0863 | 4100.00 | 1000 gals |  |
| Massachusetts | Boxboro | 10/12 /85 |  |  |  | Clean Harbors | (617)655-0863 | 2000.00 |  |  |
| Massachusetts | Littleton | 10/12 /85 |  |  |  | Clean Harbors | (617)655-0863 | 2000.00 |  |  |
| Massachusetts | Pepperell | 10/19 /85 |  |  |  | Clean Harbors | (617)655-0863 | 2565.00 | [illegible] gals |  |
| Massachusetts | Lexington | 10/19 /85 |  |  |  | Clean Harbors | (617)655-0863 | [illegible] | [illegible] |  |

Page No. 9
10/28/87

## HOUSEHOLD HAZARDOUS WASTE
## COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Massachusetts | Dover | 10/26 /85 | | | | Clean Harbors | (617)655-0863 | 4500.00 | [illegible] gals | |
| Massachusetts | Westwood | 10/26 /85 | | | | Clean Harbors | (617)655-0863 | 11860.00 | [illegible] gals | |
| Massachusetts | Weston | 10/26 /85 | | Ward Carter | (617)893-7320 | GSX Services | | | | |
| Massachusetts | Burlington | 10/27 /85 | | | | NE Solvents | (617)683-1002 | | | |
| Massachusetts | Arlington | 11/02 /85 | | | | Clean Harbors | (617)655-0863 | 4712.00 | 890 gals | |
| Massachusetts | Marshfield | 11/02 /85 | | | | Clean Harbors | (617)655-0863 | 4200.00 | 1075 gals | |
| Massachusetts | Greenfield | 11/09 /85 | | | | Clean Harbors | (617)655-0863 | 4362.00 | 630 gals | |
| Massachusetts | Medfield | 11/09 /85 | | | | NE Solvents | (617)683-1002 | | | |
| Massachusetts | Reading | 11/09 /85 | | | | NE Solvents | (617)683-1002 | | | |
| Massachusetts | Brockton | 11/16 /85 | | | | Clean Harbors | (617)655-0863 | 2410.00 | 415 gals | |
| Massachusetts | Easton | 11/16 /85 | | | | Clean Harbors | (617)655-0863 | 2315.00 | 480 gals | |
| Massachusetts | Hamilton | Fall /85 | | | | | | | | |
| Massachusetts | Leverett | Fall /85 | | | | | | | | |
| Massachusetts | Nantucket | Fall /85 | | | | | | | | |
| Massachusetts | Northrop | Fall /85 | | | | | | | | |
| Massachusetts | Shutesbury | Fall /85 | | | | | | | | |
| Massachusetts | Southborough | Fall /85 | | | | | | | | |
| Massachusetts | Natick | 4/12 /86 | | | | Clean Harbors | (617)655-0863 | 18135.00 | 3765 gals | |
| Massachusetts | Hamilton | 4/12 /86 | | | | Clean Harbors | (617)655-0863 | 6340.00 | 750 gals | |
| Massachusetts | Brewster | 4/26 /86 | | | | Clean Harbors | (617)655-0863 | 7132.00 | 1135 gals | |
| Massachusetts | Chelmsford | 5/03 /86 | | | | Clean Harbors | (617)655-0863 | 5000.00 | 835 gals | |
| Massachusetts | Scituate | 5/03 /86 | | | | Clean Harbors | (617)655-0863 | 6477.00 | 1050 gals | |
| Massachusetts | Watertown | 5/03 /86 | | Donna Moultrie | (617)464-2357 | Inland Poll Cntrl | (617)843-7110 | 11000.00 | | |
| Massachusetts | Quincy | 5/03 /86 | DPW | David Coulton | (617)773-1380 | Inland Poll Cntrl | (617)843-7110 | 47000.00 | 7590 gals | |
| Massachusetts | Belmont | 5/03 /86 | | Donna Moultrie | (617)484-2357 | Inland Poll Cntrl | (617)843-7110 | 7562.00 | | |
| Massachusetts | Wayland/Sudbury | 5/10 /86 | | | | NE Solvents | (617)683-1002 | 17025.00 | 2557 gals | |
| Massachusetts | Dartmouth | 5/10 /86 | | | | Clean Harbors | (617)655-0863 | 7020.00 | 1190 gals | |
| Massachusetts | Hanover | 5/10 /86 | | | | Clean Harbors | (617)655-0863 | 5217.00 | 965 gals | |
| Massachusetts | Plympton | 5/17 /86 | | | | Clean Harbors | (617)655-0863 | 3502.00 | 500 gals | |
| Massachusetts | Winchendon | 5/17 /86 | | | | Clean Harbors | (617)655-0863 | 4955.00 | 830 gals | |
| Massachusetts | Cambridge | 5/31 /86 | | | | Clean Harbors | (617)655-0863 | 7907.00 | 1465 gals | |
| Massachusetts | Burlington | 6/07 /86 | Town | Dick Lombard | | NE Solvents | (617)683-1002 | 8180.00 | 1030 gals | |
| Massachusetts | Stoughton | 6/14 /86 | | | | Clean Harbors | (617)655-0863 | 4572.00 | 720 gals | |
| Massachusetts | Barnstable | 6/21 /86 | Cape Cod Planning | | (617)362-2551 | NE Solvents | (617)683-1002 | 13750.00 | 1755 gals | |
| Massachusetts | Wellfleet | 6/21 /86 | Cape Cod Planning | | (617)362-2551 | NE Solvents | (617)683-1002 | 9000.00 | 850 gals | |
| Massachusetts | Falmouth | 6/28 /86 | Cape Cod Planning | | (617)362-2551 | NE Solvents | (617)683-1002 | 15850.00 | 2133 gals | |
| Massachusetts | Harwich | 6/28 /86 | Cape Cod Planning | | (617)362-2551 | NE Solvents | (617)683-1002 | 19250.00 | 2465 gals | |
| Massachusetts | Townsend | 9/13 /86 | | | | Clean Harbors | (617)655-0863 | 4305.00 | 715 gals | |
| Massachusetts | Amherst | 9/13 /86 | | | | Clean Harbors | (617)655-0863 | 11650.00 | 1955 gals | |
| Massachusetts | Ashby | 9/13 /86 | | | | Clean Harbors | (617)655-0863 | 1465.00 | | |
| Massachusetts | Concord | 9/20 /86 | | | | Clean Harbors | (617)655-0863 | 3900.00 | 540 gals | |
| Massachusetts | Plymouth | 9/20 /86 | | | | Clean Harbors | (617)655-0863 | 5795.00 | 890 gals | |
| Massachusetts | Weymouth | 9/20 /86 | Town | Jim Clark | | NE Solvents | (617)683-1002 | 22100.00 | 3758 gals | |
| Massachusetts | Stoneham | 9/27 /86 | Metro Area Planning | Judy Weigand | (617)451-2770 | NE Solvents | (617)683-1002 | 11050.00 | 1753 gals | |
| Massachusetts | Littleton | 9/29 /86 | | | | Clean Harbors | (617)655-0863 | 6727.00 | 335 gals | |
| Massachusetts | Stowe | 9/29 /86 | | | | Clean Harbors | (617)655-0863 | | | |
| Massachusetts | Boxboro | 9/29 /86 | | | | Clean Harbors | (617)655-0863 | | | |
| Massachusetts | Brockton | 10/04 /86 | | | | Clean Harbors | (617)655-0863 | 4457.00 | 690 gals | |
| Massachusetts | Andover | 10/04 /86 | Merrimac Valley | Alan McKintosh | (617)374-0519 | NE Solvents | (617)683-1002 | 17650.00 | 2605 gals | |
| Massachusetts | Waltham | 10/06 /86 | Metro Area Planning | Judy Weigand | (617)451-2770 | NE Solvents | (617)683-1002 | 8725.00 | 937 gals | |
| Massachusetts | Duxbury | 10/11 /86 | | | | NE Solvents | (617)683-1002 | 17250.00 | 2111 gals | |
| Massachusetts | Stowe | 10/12 /86 | | | | Clean Harbors | (617)655-0863 | | | |
| Massachusetts | Pepperell | 10/18 /86 | | | | Clean Harbors | (617)655-0863 | 2450.00 | 170 gals | |
| Massachusetts | Groton | 10/18 /86 | | | | Clean Harbors | (617)655-0863 | 5486.00 | 855 gals | |
| Massachusetts | Needham | 10/18 /86 | | | | Clean Harbors | (617)655-0863 | | | |

Page No. 10
10/28/87

HOUSEHOLD HAZARDOUS WASTE
COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Massachusetts | Winchester | 10/10 /86 | | Joe Tabbi | (617)721-1721 | ME Solvents | (617)683-1002 | 17000.00 | 1186 gals | |
| Massachusetts | Georgetown | 10/10 /86 | | Alan McKintosh | (617)374-0519 | ME Solvents | (617)683-1002 | 6900.00 | 748 gals | |
| Massachusetts | Marlboro | 10/10 /86 | Metro Area Planning | Judy Weinand | (617)451-2770 | ME Solvents | (617)683-1002 | 7550.00 | 857 gals | |
| Massachusetts | Arlington | 10/25 /86 | | | | Clean Harbors | (617)655-0063 | 8000.00 | | |
| Massachusetts | Westwood | 10/25 /86 | | | | Clean Harbors | (617)655-0063 | 15366.00 | 2780 gals | |
| Massachusetts | Haverhill | 10/25 /86 | | Alan McKintosh | (617)374-0519 | ME Solvents | (617)683-1002 | 13250.00 | 1911 gals | |
| Massachusetts | Westford | 10/25 /86 | | Denise Lawler | (617)275-7120 | ME Solvents | (617)683-1002 | 7350.00 | 763 gals | |
| Massachusetts | Wilmington | 10/25 /86 | Metro Area Planning | Judy Weinand | (617)451-2770 | ME Solvents | (617)683-1002 | 11000.00 | 1416 gals | |
| Massachusetts | Lexington | 10/25 /86 | | George Smith | | ME Solvents | (617)683-1002 | 35050.00 | 6033 gals | |
| Massachusetts | Bridgewater | 11/01 /86 | | Nancy Keohan | (617)697-6454 | Inland Poll Cntrl | (617)843-7110 | | 3300 gals | |
| Massachusetts | Woburn | 11/01 /86 | Metro Area Planning | Judy Weinand | (617)451-2770 | ME Solvents | (617)683-1002 | 20300.00 | 3162 gals | |
| Massachusetts | Sterling | 11/01 /86 | | Robert Flynn | (617)456-0021 | ME Solvents | (617)683-1002 | 7300.00 | 552 gals | |
| Massachusetts | Wellesley | 11/01 /86 | Metro Area Planning | Judy Weinand | (617)451-2770 | ME Solvents | (617)683-1002 | 17100.00 | 1386 gals | |
| Massachusetts | Wrentham | 11/01 /86 | | Maureen Ooliah | (617)565-1500 | ME Solvents | (617)683-1002 | 12300.00 | 1652 gals | |
| Massachusetts | Greenfield | 11/08 /86 | | | | ME Solvents | (617)683-1002 | 18000.00 | 3520 gals | |
| Massachusetts | New Bedford | 11/08 /86 | SE Regional Planning | Steve Smith | (617)826-1367 | ME Solvents | (617)683-1002 | 9450.00 | 1125 gals | |
| Massachusetts | Canton | 11/08 /86 | Public Health Dist | | | ME Solvents | (617)683-1002 | 11700.00 | 1620 gals | |
| Massachusetts | Orange | 11/08 /86 | | Jim Bohrman | (413)776-4015 | ME Solvents | (617)683-1002 | 3000.00 | 346 gals | |
| Massachusetts | Plymouth | 11/08 /86 | | | | Clean Harbors | (617)655-0063 | 16616.00 | 2780 gals | |
| Massachusetts | Holyoke | 11/09 /86 | | | | Clean Harbors | (617)655-0063 | 15601.00 | 2645 gals | |
| Massachusetts | Orange | 11/15 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Sharon | 11/15 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Walpole | 11/15 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Melrose | 11/15 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | N. Reading | 11/22 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Dover/Medfield | 11/22 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Cohasset/Hingham | 11/22 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Ayer/Bolton | 11/22 /86 | | | | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Acton | Fall /86 | | | | Clean Harbors | (617)655-0063 | 4522.00 | 770 gals | |
| Massachusetts | Chelmsford | Fall /86 | | | | Clean Harbors | (617)655-0063 | 8255.00 | 1355 gals | |
| Massachusetts | W. Springfield | Fall /86 | | | | Clean Harbors | (617)655-0063 | 11000.00 | 1350 gals | |
| Massachusetts | Williamstown | Fall /86 | | | | Clean Harbors | (617)655-0063 | | | |
| Massachusetts | Bolton | Fall /86 | | | | Clean Harbors | (617)655-0063 | | | |
| Massachusetts | Lee | Fall /86 | | | | Clean Harbors | (617)655-0063 | | | |
| Massachusetts | Avon | Fall /86 | | | | Clean Harbors | (617)655-0063 | 2172.00 | 220 gals | |
| Massachusetts | Lenox | Fall /86 | | | | Clean Harbors | (617)655-0063 | | | |
| Massachusetts | Boston | Fall /86 | | | | Clean Harbors | (617)655-0063 | 5206.00 | 855 gals | |
| Massachusetts | Holliston | Fall /86 | | | | Clean Harbors | (617)655-0063 | 4500.00 | 635 gals | |
| Massachusetts | N. Attleboro | Fall /86 | DPW | Jack Busch | (617)695-3102 | Franklin Pumping | (617)304-6151 | | | |
| Massachusetts | Taunton/Raynham | Fall /86 | Towns | Roger Hoffman | (617)822-2700 | McDonald & Watson | (401)942-0200 | 17000.00 | | |
| Massachusetts | Plymouth | 3/20 /87 | | | | Clean Harbors | (617)655-0063 | 2621.00 | 15 drums | |
| Massachusetts | Auburn/Oxford | 4/11 /87 | Bd of Selectmen | Alice Walker | (617)987-8936 | ME Solvents | (617)683-1002 | 10825.00 | 32 drums | |
| Massachusetts | Hamilton | 4/11 /87 | | | | Clean Harbors | (617)655-0063 | 6264.00 | 32 drums | |
| Massachusetts | Middleborough | 4/25 /87 | | John Healey | (617)947-0920 | Clean Harbors | (617)655-0063 | 12420.00 | 62 drums | |
| Massachusetts | Westborough | 4/25 /87 | | Paul McNylty | (617)366-7100 | ME Solvents | (617)683-1002 | 6500.00 | 16 drums | |
| Massachusetts | Groton | 4/25 /87 | | | | Clean Harbors | (617)655-0063 | 6985.00 | 32 drums | |
| Massachusetts | S. Dartmouth | 5 /87 | Town | Bob Galloso | | McDonald & Watson | | 17000.00 | | |
| Massachusetts | Holden | 5/02 /87 | | John Westerling | (617)829-6561 | ME Solvents | (617)683-1002 | 6200.00 | 14 drums | |
| Massachusetts | Natick | 5/02 /87 | Clean Harbors | Steve Ganley | (617)655-0063 | Clean Harbors | (617)655-0063 | | 44 drums | |
| Massachusetts | Wayland/Sudbury | 5/09 /87 | Towns | Mike Sullivan | (617)443-8891 | ME Solvents | (617)683-1002 | 17725.00 | 52 drums | |
| Massachusetts | Hanover | 5/09 /87 | | | | Clean Harbors | (617)655-0063 | 4672.00 | 20 drums | |
| Massachusetts | Tewksbury | 5/16 /87 | | | | Clean Harbors | (617)655-0063 | 3736.00 | 22 drums | |
| Massachusetts | Cambridge | 5/30 /87 | | Suzanne Dworsky | | Clean Harbors | (617)655-0063 | 4632.00 | 20 drums | |
| Massachusetts | Burlington | 6/06 /87 | Town | Dick Lombard | (617)272-6700 | ME Solvents | (617)683-1002 | | | |
| Massachusetts | Westfield | 6/06 /87 | | Daniel Reardon | (617)568-9161 | Clean Harbors | (617)655-0063 | 6815.00 | 41 drums | |

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| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Massachusetts | Braintree | 6/06 /87 | Clean Harbors | Fike Hatch | (617)849-1800 | Clean Harbors | (617)655-8863 | 12700.00 | 49 drums | |
| Massachusetts | Halifax | 6/13 /87 | | | | Clean Harbors | (617)655-8863 | 3423.00 | 24 drums | |
| Massachusetts | Stoughton | 6/13 /87 | | | | Clean Harbors | (617)655-8863 | 7822.00 | 35 drums | |
| Massachusetts | Tewksbury | 6/20 /87 | | | | Clean Harbors | (617)655-8863 | 3996.00 | 24 drums | |
| Massachusetts | Seekonk/Rehoboth | 6/27 /87 | | Manuel Mello | (617)366-7400 | Clean Harbors | (617)655-8863 | 10420.00 | 47 drums | |
| Massachusetts | Templeton | 7/18 /87 | LWV | Maureen Blasco | (617)297-0996 | Clean Harbors | (617)655-8863 | 6568.00 | | |
| Massachusetts | Littleton | 8/17 /87 | | | | Clean Harbors | (617)655-8863 | 1527.00 | | |
| Massachusetts | N. Attleboro | 9/03 /87 | DPW | Jack Busch | (617)695-3102 | Franklin Pumping | (617)384-6151 | | | |
| Massachusetts | Amherst | 9/12 /87 | | Joanie Newman | (413)323-4548 | Clean Harbors | (617)655-8863 | 11635.00 | 42 drums | |
| Massachusetts | Plymouth | 9/19 /87 | | | | Clean Harbors | (617)655-8863 | 7300.00 | 22 drums | |
| Massachusetts | Marshfield | 9/26 /87 | | Robert Canevazzi | (617)747-1620 | Clean Harbors | (617)655-8863 | 7350.00 | 20 drums | |
| Massachusetts | Brockton/Avon | 9/26 /87 | | Carolyn Stone | (617)580-1100 | Clean Harbors | (617)655-8863 | 18105.00 | | |
| Massachusetts | Reading | 9/26 /87 | | Ruth Coran | (617)942-0500 | Clean Harbors | (617)655-8863 | 11760.00 | 31 drums | |
| Massachusetts | Boxboro/Acton/Stow | 9/26 /87 | | Douglas Halley | (617)264-9624 | Clean Harbors | (617)655-8863 | 3925.00 | | |
| Massachusetts | Ashby/Townsend | 10/03 /87 | Towns | Beth Parsons | (617)597-8058 | Clean Harbors | (617)655-8863 | 11775.00 | | |
| Massachusetts | Concord | 10/10 /87 | | | | Clean Harbors | (617)655-8863 | 5225.00 | | |
| Massachusetts | Kingston | 10/10 /87 | Clean Harbors | Mike Hatch | (617)655-8863 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Bedford | 10/17 /87 | Town of | Carla Priest | (617)275-6507 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Pepperell | 10/17 /87 | Town | Cheryl Rose | (617)433-6700 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Longmeadow | 10/17 /87 | Town | Russell Denver | (413)567-5433 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Chelmsford | 10/24 /87 | Town | Richard Day | (617)256-2061 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Manchester | 10/24 /87 | Town | Linda Zaner | (617)526-7365 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Needham | 10/24 /87 | Town | | | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Westwood | 10/31 /87 | Town | David Block | (617)326-4469 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Boxford/Topsfield | 10/31 /87 | Towns | Ira Singer | (617)777-3417 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Williamstown | 10/31 /87 | Town | Steve LaDeux | (413)458-3500 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Franklin | 11 /87 | | Walter Jack | | Franklin Pumping | (617)384-6151 | | | |
| Massachusetts | S. Hadley | 11/07 /87 | Town | Phillip Pattison | (413)538-5033 | HE Solvents | (617)683-1002 | | | |
| Massachusetts | Greenfield | 11/07 /87 | Franklin CPC | Lynn Rubenstein | (413)774-4015 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Northampton | 11/07 /87 | | Peter McErlain | (413)586-6950 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Belmont/Watertown | 11/07 /87 | | John Malone | (617)484-2357 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Southampton | 11/14 /87 | | Charles Koniecki | (617)527-4741 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Winchester | 11/14 /87 | | Joseph Tobbi | (617)721-7121 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Weymouth | 11/14 /87 | | James Clark | (617)335-2000 | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Arlington | 11/21 /87 | Public Hlth Dept | | | Clean Harbors | (617)655-8863 | | | |
| Massachusetts | Billerica | 11/21 /87 | Town | Paul Talbot | (617)667-7182 | Clean Harbors | (617)655-8863 | | | |
| Michigan | Midland | 10/20 /84 | Dow Chemical | | | | | | 2964 lbs | 89 |
| Michigan | Traverse City | Spr. /84 | Dow Chemical | Patti Temple | (517)636-5783 | | | | | |
| Michigan | Ann Arbor | Fall /84 | | | | Drug & Lab | (616)685-9824 | | | |
| Michigan | Traverse City | Spr. /85 | Dow Chemical | Patti Temple | (517)636-5783 | | | | | |
| Michigan | Midland | Spr. /85 | Dow Chemical | | | | | | | |
| Michigan | Ann Arbor | Fall /85 | | | | Drug & Lab | (616)685-9824 | | | |
| Michigan | Ingham Cnty | Fall /85 | | | | Drug & Lab | (616)685-9824 | | | |
| Michigan | Kent City | Fall /85 | Dow Chemical | | | | | | | |
| Michigan | Oakland | Fall /85 | Dow Chemical | | | | | | | |
| Michigan | Saginaw | Fall /85 | Dow Chemical | | | | | | | |
| Michigan | Bay City | Fall /85 | Dow Chemical | | | | | | | |
| Michigan | Alpena | 6/07 /86 | 4th Dist Hlth Dept | Dick Silver | (571)356-4507 | Drug & Lab | (616)685-9824 | 7220.00 | 1007 kg | 55 |
| Michigan | Detour/Sault(2) | 8/19 /86 | Chippewa Cnty Hlth | David Martin | (906)635-1566 | Drug & Lab | (616)685 9824 | 14516.00 | 2016 kg | 52 |
| Michigan | Petoskey | 8/23 /86 | 3rd Dist Hlth Dept | Burt Notestine | (616)347-6014 | Drug & Lab | (616)685 9824 | 8862.00 | 2359 kg | 111 |
| Michigan | Holland Cnty | 9/13 /86 | | Roger Stroh | (616)396-1365 | Drug & Lab | (616)685 9824 | 16467.45 | 5528 kg | 788 |
| Michigan | Kent Cnty | 9/13 /86 | Cnty Hlth Dept | Katherine Robins | (616)774-3694 | Dow Chemical | | | 3650 gals | 539 |
| Michigan | Calhoun Cnty | 9/20 /86 | | Ted Haven | (616)966-1241 | Dow Chemical | | 18147.00 | 8649 kg | 301 |
| Michigan | Genesee | 9/27 /86 | Health Dept | Tom Moore | (313)257 3603 | Drug & Lab | (616)685 9824 | 10115.59 | 1118 kg | 115 |
| Michigan | Saginaw | 10/01 /86 | | Patti Temple | (517)636-5783 | Dow Chemical | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| Michigan | Isabella Cnty | 10/04 /86 | Extension Office | Lyle Thoresen | (517)772-0911 | Drug & Lab | (616)685-9826 | 8010.82 | [illegible] | |
| Michigan | Ann Arbor | 10/04 /86 | Health Dept | David Pluddemann | (313)994-2566 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Jackson Cnty* | 10/04 /86 | Health Dept | Bob Cora | (517)887-6900 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Macomb Cnty | 10/04 /86 | Health Dept | Vaughan Warner | (313)469-5236 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Traverse City | Sep. /86 | | | | Dow Chemical | | | | |
| Michigan | Ludington | Sep. /86 | | | | Dow Chemical | | | | |
| Michigan | Kalamazoo | 5 /87 | Cnty of Kalamazoo | Dean Holub | (616)384-8112 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Grand Traverse | 5 /87 | Cnty Coop Ext | Tim Johnson | (616)929-2106 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Monroe | 5 /87 | City of Monroe | Jim Moore | (313)243-7155 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Ottawa Cnty | 5 /87 | Cnty of Ottawa | Pam Bovee | | Drug & Lab | (616)685-9826 | | | |
| Michigan | Alpena | 6 /87 | County | Richard Silver | (517)736-2199 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Holland | 10 /87 | City of Holland | Peter Strab | (616)396-1365 | Drug & Lab | (616)685-9826 | | | |
| Michigan | Hillsdale | 10/10 /87 | Branch/Hillsdale | Craig Laurent | (616)467-9835 | Drug & Lab | (616)685-9826 | | | |
| Minnesota | Inver Grove Hts | 9/14 /85 | BFI/City | John Sachi | (612)457-2111 | CECOS | | 10000.00 | 1820 gals | 165 |
| Minnesota | Duluth/WLSSD | 9/21 /85 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 7488.00 | 1050 gals | 106 |
| Minnesota | St. Paul | 10/12 /85 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 9213.00 | 1985 gals | 150 |
| Minnesota | Benson | 10/19 /85 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 3350.00 | 220 gals | 45 |
| Minnesota | Winona Cnty | 10/26 /85 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 11825.00 | 1259 gals | 210 |
| Minnesota | Honeywell (4) | 11/12 /85 | Honeywell | Chuck Goodelman | (612)870-5575 | MEI | (612)469-3475 | 14000.00 | 5000 lbs | 80 |
| Minnesota | Cannon Falls | 4/26 /86 | MPCA/local | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 9000.00 | 1330 gals | 149 |
| Minnesota | Roseville/Sperry | 5/02 /86 | MPCA/Sperry | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 14000.00 | 2450 gals | 116 |
| Minnesota | Bemidji | 5/10 /86 | MPCA/Cnty | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 5200.00 | 1180 gals | 85 |
| Minnesota | Northfield | 5/17 /86 | City of Northfield | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 4400.00 | 740 gals | 105 |
| Minnesota | Duluth (10 days) | 6 /86 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 6000.00 | 1665 gals | 175 |
| Minnesota | Mankato | 6/07 /86 | MPCA/local | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 10000.00 | 1885 gals | 276 |
| Minnesota | Winona | 6/14 /86 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 6500.00 | 975 gals | 169 |
| Minnesota | Slayton | 6/21 /86 | MPCA | Susan Bidley | (612)297-1653 | MEI | (612)469-3475 | 2100.00 | 260 gals | 16 |
| Minnesota | Inver Grove Hts | 9/20 /86 | BFI | John Sachi | (612)457-2111 | CECOS | | | 1625 gals | 120 |
| Minnesota | Hennepin Cnty | 10/18 /86 | Cnty | Greg Lie | (612)348-2556 | MEI | (612)469-3475 | 82000.00 | 10376 gals | 1100 |
| Minnesota | Duluth (1/week) | 5 /87 | WLSSD/EPA | Joe Stepun | (218)722-3336 | MEI | (612)469-3475 | | | |
| Minnesota | Hennepin(15)-3 wks | 9/12 /87 | Hennepin Cnty | Greg Lee | (612)348-2556 | Chem Waste Mgt | | 401000.00 | 32661 gals | 4400 |
| Minnesota | Inver Grove Hts | 9/19 /87 | BF/Dakota Cnty | John Sachi | (612)457-2111 | CECOS | | | | |
| Minnesota | Willmar | 9/19 /87 | MPCA/EPA/Cnty | Ned Brooks | (612)296-7352 | GSX Services | | 15000.00 | 1125 gals | 248 |
| Minnesota | St. Cloud | 10/03 /87 | MPCA/EPA/local | Ned Brooks | (612)296-7352 | MEI | (612)469-3475 | 20000.00 | 1973 gals | 369 |
| Minnesota | Brainerd | 10/17 /87 | MPCA/local | Boomer Bonono | (612)296-7170 | MEI | (612)469-3475 | | | |
| Minnesota | Hastings | 10/24 /87 | MPCA/local | Boomer Bonono | (612)296-7170 | MEI | (612)469-3475 | | | |
| Minnesota | Marshall | 10/31 /87 | MPCA/local | Boomer Bonono | (612)296-7170 | MEI | (612)469-3475 | | | |
| Minnesota | Eagan | 11/07 /87 | Sperry/Dakota Cnty | George Kinney | | | | | | |
| Montana | Missoula | 10/16 /86 | Sol.& Haz. Waste Bur | Roger C. Thorvilson | (406)444-2821 | IT Corporation | (303)694-0044 | 106500.00 | 1873 gals | |
| Nebraska | Lincoln | 6/08 /85 | County | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | | | 41 |
| Nebraska | Waverly | 9/07 /85 | County | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | | | 6 |
| Nebraska | Lincoln | 11/03 /85 | County | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | | | 40 |
| Nebraska | Lincoln | 3/30 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | 2500.00 | 567 lbs | 14 |
| Nebraska | Lincoln (2 days) | 4/26 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | 6000.00 | 2152 lbs | 16 |
| Nebraska | Lincoln (2 days) | 5/26 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | 6000.00 | 1409 lbs | 56 |
| Nebraska | Lincoln (2 days) | 6/21 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | 6000.00 | 2287 lbs | 59 |
| Nebraska | Lincoln | 7 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | | | | | |
| Nebraska | Lincoln (2 days) | 7/13 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | GSX Services | (800)251-1227 | 6000.00 | 1687 lbs | 56 |
| Nebraska | Lincoln (2 days) | 10/11 /87 | Cnty Hlth Dept | Richard Sloan | (402)471-7800 | | | 5050.00 | 2805 lbs | 71 |
| New Hampshire | Hartford (w/VT) | 11/03 /84 | Upper Valley Reg | Victor Jas | (603)643-5672 | NE Marine Contr | (802)897-0800 | | 1100 gals | 109 |
| New Hampshire | Dover | 4/20 /85 | Div Pub Hlth Srvcs | | | Coating Systems | | | | |
| New Hampshire | Hanover | 5/04 /85 | Upper Valley RPC | Victor Jas | (603)643-5672 | NE Marine Contr | | 6000.00 | 1175 gals | 111 |
| New Hampshire | Exeter | 5/18 /85 | Rockingham Cnty PC | | | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Salem | 5/19 /85 | Rockingham Cnty PC | | | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Manchester | 4/26 /86 | LWV | Anne McDonough | (603)668-1580 | NE Solvents | (617)681-1002 | 22400.00 | 2675 gal | |

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|---|---|---|---|---|---|---|---|---|---|---|
| New Hampshire | Bedford | 4/26 /86 | Conservation Comm | Carol Anderson | (603)472-8472 | ME Solvents | (617)683-1002 | 8116.00 | 915 | |
| New Hampshire | Exeter/Kingston | 5/03 /86 | Rockingham Cnty PC | Sara Campbell | (603)778-0855 | Coating Systems | (603)883-0553 | | 1400 gals | 117 |
| New Hampshire | Lebanon | 5/03 /86 | Lake Sunapee Cncl | Bob Varney | (603)448-1680 | ME Marine Contr | (802)879-8800 | 11164.00 | 2090 gals | 240 |
| New Hampshire | Portsmouth | 5/10 /86 | Rockingham Cnty PC | Sara Campbell | (603)778-0885 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Cheshire Cnty | 5/17 /86 | SW RPC | Dean Shankle | (603)357-1165 | Coating Systems | (603)883-0553 | 9528.00 | | 71 |
| New Hampshire | Nashua/Milford | 6/07 /86 | Reg Sld Wste Dist | Marla Engel | (603)883-0366 | Coating Systems | (603)883-0553 | 29536.00 | 3912 gals | 100 |
| New Hampshire | Conway | 9/20 /86 | Solid Waste Dist | John Walsh | (603)447-3811 | Coating Systems | (603)883-0553 | 7832.00 | 1000 gals | 42 |
| New Hampshire | Concord | 9/27 /86 | Solid Waste Dist | Ron Ford | (603)225-0520 | Coating Systems | (603)883-0553 | 14100.00 | 3445 gals | 290 |
| New Hampshire | Plaistow/Salem | 10/18 /86 | State/Rockingham | Sara Campbell | (603)778-0885 | Coating Systems | (603)883-0553 | | 2695 gals | 156 |
| New Hampshire | Epping/Raymond | 10/25 /86 | State/Rockingham | Sara Campbell | (603)778-0885 | Coating Systems | (603)883-0553 | | 2530 gals | 87 |
| New Hampshire | Rockingham Cty (3) | 4/04 /87 | Rockingham Cnty PC | | (603)778-0885 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Rockingham Cty (3) | 4/11 /87 | Rockingham Cnty PC | | (603)778-0885 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Rockingham Cty (3) | 4/25 /87 | Rockingham Cnty PC | | (603)778-0885 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Lebanon | 5/02 /87 | Upper Valley Lake | Marsha Patrick | (603)448-1680 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | Rockingham Cty (2) | 5/02 /87 | Rockingham Cnty PC | | (603)778-0885 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Newport | 5/09 /87 | Sullivan Cnty | Constance Leach | (603)543-1201 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | Littleton | 5/09 /87 | N. County Council | Joanne Whitcomb | (603)823-5566 | Clean Harbors | (617)849-1800 | | | |
| New Hampshire | Milford | 5/16 /87 | Nashua SWD&PC | Harry Smith | (603)883-0366 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Merrimack | 5/16 /87 | Nashua SWD&PC | Harry Smith | (603)883-0366 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Conway | 6/06 /87 | Town of Conway | John Walsh | (603)447-3811 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Nashua | 6/13 /87 | Nashua SWD&PC | Harry Smith | (603)883-0366 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Hudson | 6/13 /87 | Nashua SWD&PC | Harry Smith | (603)883-0366 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Meredith | 8/29 /87 | Lakes RPC | Kim Koulet | (603)279-8171 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | Alton | 8/29 /87 | Lakes RPC | Kim Koulet | (603)279-8171 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | New Boston | 9/19 /87 | New Boston Fire Dept | Mike Richard | (603)487-2158 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | Hillsboro | 9/19 /87 | CNHWMA | Mark School | (603)525-4162 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | Peterborough | 9/19 /87 | CNHWMA | Mark School | (603)525-4162 | ME Solvents | (617)683-1002 | | | |
| New Hampshire | Dover | 9/26 /87 | Strafford Cnty RPC | Stephen Burns | (603)742-2523 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Rochester | 9/26 /87 | Strafford Cnty RPC | Stephen Burns | (603)742-2523 | Coating Systems | (603)883-0553 | | | |
| New Hampshire | Concord | 10/10 /87 | Concord Pub Works | Steven Allyn | (603)225-0520 | Clean Harbors | (617)849-1800 | | | |
| New Jersey | Morris Cnty | 5/18 /85 | DEP.County | Ralph Davis | (609)292-8341 | Adv Env Tech Corp | (201)347-7111 | 5439.00 | | |
| New Jersey | Hunterdon Cnty | 5/18 /85 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | 24000.00 | | 190 |
| New Jersey | Gloucester Cnty | 6/18 /85 | DEP.County | Ralph Davis | (609)292-8341 | | | 10000.00 | | |
| New Jersey | Morris Cnty | 10/05 /85 | DEP.County | Ralph Davis | (609)292-8341 | | | 8699.00 | | |
| New Jersey | Somerset Cnty | 10/19 /85 | DEP.County | Ralph Davis | (609)292-8341 | | | 11000.00 | | |
| New Jersey | Burlington Cnty | 10/26 /85 | DEP.County | Ralph Davis | (609)292-8341 | Adv Env Tech Corp | (201)347-7111 | 13408.00 | | |
| New Jersey | Atlantic Cnty | 11/09 /85 | DEP.County | Ralph Davis | (609)292-8341 | | | 9225.00 | | |
| New Jersey | Union Cnty | 11/23 /85 | DEP.County | Ralph Davis | (609)292-8341 | | | 11000.00 | | |
| New Jersey | Monmouth Cnty | 4/19 /86 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | 29910.00 | | |
| New Jersey | Cumberland Cnty | 10/04 /86 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | | | |
| New Jersey | Somerset Cnty | 10/11 /86 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | | | |
| New Jersey | Hunterdon Cnty | 10/18 /86 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | | | |
| New Jersey | Burlington Cnty | 10/25 /86 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | | | |
| New Jersey | Morris Cnty | 10/25 /86 | DEP.County | Ralph Davis | (609)292-8341 | Adv Env Tech Corp | (201)347-7111 | | | |
| New Jersey | Atlantic Cnty | 11/15 /86 | DEP.County | Ralph Davis | (609)292-8341 | Radiac Research | | | | |
| New Jersey | Hunterdon Cnty | 4 /87 | County | Ralph Davis | (609)292-8341 | Radiac | (718)963-2233 | | | |
| New Jersey | Union Cnty | 5 /87 | County | Ralph Davis | (609)292-8341 | Radiac | (718)963-2233 | | | |
| New Jersey | Sussex Cnty | 7 /87 | County | Ralph Davis | (609)292-8341 | Adv Env Tech Corp | (201)347-7111 | | | |
| New Mexico | Albuquerque | 10/18 /85 | Bernalillo Cnty | Donna Lacombe | (505)766-7434 | GSX Services | | 87213.00 | | 1071 |
| New York | Broome Cnty | Spr. /82 | | Claudia Stalman | (607)772-2116 | | | 1200.00 | 605 gals | 98 |
| New York | Broome Cnty | Spr. /83 | | Claudia Stalman | (607)772-2116 | | | | 770 gals | 60 |
| New York | Niagara | Spr. /83 | SCA/Cecos | | | | | | | |
| New York | Oneida | Spr. /83 | | | | SCA | | 2300.00 | 990 gals | 126 |
| New York | Rockland Cnty | Fall /83 | | Barbara Pucca | (914)354-0200 | | | | 2090 gals | [illegible] |
| New York | Oneida | Spr. /84 | | Hans Arnold | (315)798-5713 | GSX Services | | 2500.00 | 1100 gal | |

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Page No. 14
10/28/87

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| New York | Columbia | Spr. /84 | | Ronald Vosburgh | (518)828-3375 | SCA | | 23300.00 | [illegible] | [illegible] |
| New York | Broome Cnty | 6 /85 | Cnty Env Council | Claudia Stalnon | (607)772-2114 | | | 5000.00 | 2650 lbs | [illegible] |
| New York | Onondaga | Spr. /85 | | Dave Colburn | (315)425-2640 | GSX Services | | | | |
| New York | Oswego | Dec. /85 | | Bob Shearer | (315)349-3270 | | | | | |
| New York | Schenectady | Spr. /85 | | Denise Cashmore | (518)382-3206 | | | | 1320 gals | 156 |
| New York | Islip (3) | Dec. /85 | | | | | | | | |
| New York | Westchester Cnty | Dec. /85 | County | Liz Hendrick | (914)285-5044 | Chem Poll Cntrl | | | 1100 gals | |
| New York | Rockland Cnty | Fall /85 | County | Barbara Porta | (914)354-0200 | GSX Services | | | | |
| New York | Long Island (4) | Fall /85 | | | | | | | | |
| New York | Broome Cnty | 5/17 /86 | County | Claudia Stalnon | (607)772-2114 | GSX Services | | 9000.00 | 1590 lbs | 107 |
| New York | Hempstead | 6/05 /86 | NYS DEC | Patricia McKenna | (516)378-4210 | CECOS | (716)873-4200 | | | |
| New York | East Norwich | 9/06 /86 | NYSDEC | Eric Swenson | (516)921-7346 | Chem Poll Cntrl | (516)586-0333 | 7650.00 | 26 drums | 62 |
| New York | N. Massapequa | 9/20 /86 | NYSDEC | Eric Swenson | (516)921-7346 | Chem Poll Cntrl | | 7450.00 | 26 drums | 70 |
| New York | Huntington | 9/27 /86 | NYSDEC | Janet Dieterich | (516)351-3186 | Chem Poll Cntrl | | | | |
| New York | Hicksville | 10/04 /86 | NYSDEC | Eric Swenson | (516)921-7346 | Chem Poll Cntrl | | 6150.00 | 30 drums | 105 |
| New York | East Setauket | 10/11 /86 | NYSDEC | Chick Voorhis | (516)654-7914 | Chem Poll Cntrl | | | | |
| New York | Ridge | 10/18 /86 | NYSDEC | Chick Voorhis | (516)654-7914 | Chem Poll Cntrl | | | | |
| New York | Roslyn | 10/18 /86 | NYSDEC | Clyde Perro | (516)621-0906 | Chem Poll Cntrl | | | | |
| New York | Holtsville | 10/25 /86 | NYSDEC | Chick Voorhis | (516)654-7914 | Chem Poll Cntrl | | | | |
| New York | Riverhead | 11/08 /86 | NYSDEC | George Bartunek | (516)727-3097 | Chem Poll Cntrl | | | | |
| New York | New Hyde Park | 11/09 /86 | NYSDEC | Clyde Perro | (516)621-0906 | Chem Poll Cntrl | | | | |
| New York | North Sea | 11/22 /86 | NYSDEC | Jim McCulley | (516)283-6000 | Chem Poll Cntrl | | | | |
| New York | Sag Harbor | 11/22 /86 | NYSDEC | Jim McCulley | (516)283-6000 | Chem Poll Cntrl | | | | |
| New York | Hampton Bays | 12/06 /86 | NYSDEC | Jim McCulley | (516)283-6000 | Chem Poll Cntrl | | | | |
| New York | Westhampton | 12/06 /86 | NYSDEC | Jim McCulley | (516)283-6000 | Chem Poll Cntrl | | | | |
| New York | Southold | 12/06 /86 | NYSDEC | Jim McMann | (516)765-1892 | Chem Poll Cntrl | | | | |
| New York | Southampton | 12/06 /86 | NYS DEC | Jim McCulley | (516)283-6055 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Long Island (3) | Spr. /86 | | | | | | | | |
| New York | Duchess | Spr. /86 | | Bonnie McLeod | (914)677-3400 | | | | | |
| New York | Westchester Cnty | Fall /86 | | | | GSX Services | | | | |
| New York | North Hempstead | 3/28 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Oyster Bay | 4/25 /87 | NYS DEC | Eric Swenson | (516)921-7367 | Chem Poll Cntrl | (516)586-0333 | 6675.00 | 1375 gals | 46 |
| New York | North Hempstead | 4/25 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Huntington | 5/02 /87 | NYS DEC | Janet Dieterich | (516)351-3186 | Chem Poll Cntrl | (516)586-0333 | 10000.00 | 1705 gals | 120 |
| New York | Hempstead | 5/09 /87 | NYS DEC | Patricia McKenna | (516)378-4210 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Oyster Bay | 5/16 /87 | NYS DEC | Eric Swenson | (516)921-7367 | Chem Poll Cntrl | (516)586-0333 | 9725.00 | 2145 gals | 127 |
| New York | Shelter Island | 5/23 /87 | NYS DEC | Heather Baylock | (516)749-0293 | Chem Poll Cntrl | (516)586-0333 | 7000.00 | 1210 gals | 87 |
| New York | North Hempstead | 5/30 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Southampton | 6/20 /87 | NYS DEC | Jim McCulley | (516)283-6055 | Chem Poll Cont | (516)586-0333 | | | |
| New York | Oyster Bay | 6/26 /87 | NYS DEC | Eric Swenson | (516)921-7367 | Chem Poll Cntrl | (516)586-0333 | 9025.00 | 1925 gals | 96 |
| New York | North Hempstead | 6/27 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Southampton | 7/18 /87 | NYS DEC | Jim McCulley | (516)283-6055 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | North Hempstead | 7/26 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | North Hempstead | 8/29 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Oyster Bay | 9/19 /87 | NYS DEC | Eric Swenson | (516)921-7367 | Chem Poll Cntrl | (516)586-0333 | 5025.00 | 1045 gals | 62 |
| New York | North Hempstead | 9/26 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Islip | 10/03 /87 | NYS DEC | Frank Smith | (516)224-5600 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Grand Island | 10/10 /87 | Town of Grand Island | Marion Sabine | | CECOS | (716)873-4200 | 6000.00 | 660 gals | 40 |
| New York | Oyster Bay | 10/17 /87 | NYS DEC | Eric Swenson | (516)921-7367 | Chem Poll Cntrl | (516)586-0333 | 7025.00 | 1405 gals | 117 |
| New York | Hempstead | 10/17 /87 | NYS DEC | Patricia McKenna | (516)378-4210 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Brooklyn | 10/17 /87 | | Cyprian Cox | (212)669-0924 | Clean Harbors | (617)655-0863 | | | |
| New York | Putnam County | 10/17 /87 | NYS DEC | Larry Weiner | | Radiac Research | (718)963-2233 | | | |
| New York | Brookhaven | 10/24 /87 | NYS DEC | John Pavacic | (516)543-4444 | Chem Poll Cont | (516)586-0333 | | | |
| New York | North Hempstead | 10/31 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | Brookhaven | 10/31 /87 | NYS DEC | John Pavacic | (516)543-4444 | Chem Poll Cntrl | (516)586-0333 | | | |

Page No. 15
10/28/87

## HOUSEHOLD HAZARDOUS WASTE
## COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| New York | Brookhaven | 11/07 /87 | NYS DEC | John Pavacic | (516)543-4444 | Chem Poll Cont | (516)586-0333 | | | |
| New York | Oyster Bay | 11/14 /87 | NYS DEC | Eric Swanson | (516)921-7347 | Chem Poll Cntrl | (516)586-0333 | | | |
| New York | North Hempstead | 11/21 /87 | NYS DEC | Rhoda Becker | (516)627-0590 | Chem Poll Cntrl | (516)586-0333 | | | |
| North Carolina | Reidsville | 6 /85 | GSX Services | Ken Webb | (800)334-5953 | GSX Services | (800)334-5953 | | 3850 lbs | |
| North Carolina | Eden | 6 /85 | GSX Services | Ken Webb | (800)334-5953 | GSX Services | (800)334-5953 | | 2770 lbs | |
| Ohio | Cincinnati | Fall /84 | Cecos | Pete Kinshlee | (513)681-5738 | Cecos | (513)681-5738 | | | |
| Ohio | Canton | Fall /84 | LWV of OH | Patricia Starr | (216)499-3657 | | | | | |
| Ohio | Cleveland* (1/mo.) | 5 /86 | Cncl on Haz Mat'ls | Bob Staib | (216)961-4646 | Sensol Srvcs | (216)861-3949 | 50000.00 | 120 lbs | 120 |
| Oregon | Gresham | Fall /82 | Gresham Fire Dept | Len Malmquist | (503)661-3000 | | | | | |
| Oregon | Gresham | Spr. /83 | Fire Dept | Len Malmquist | (503)661-3000 | Pegasus | (800)354-9033 | | | |
| Oregon | Gresham | Spr. /84 | Fire Dept | Len Malmquist | (503)661-3000 | Pegasus | | | | |
| Oregon | Lane Cnty | 5/10 /86 | Sld Waste Dist | Mike Turner | (503)687-4119 | Pegasus | (800)354-9033 | | | |
| Oregon | Portland/Gresham | 11/15 /86 | Portland Fire Dept | Len Malmquist | (503)221-1646 | Pegasus | (600)354-9033 | 83583.00 | 101 drums | 655 |
| Oregon | Lane Cnty | 5/09 /87 | Lane Cnty | Mike Turner | (503)687-4119 | Pegasus | (800)354-9033 | 13400.00 | 22 drums | 77 |
| Oregon | Gresham | Spr. /87 | Gresham Fire Dept | Len Malmquist | (503)661-3000 | Pegasus | (800)354-9033 | | | |
| Pennsylvania | York Cnty | 10/18 /85 | LWV/Sld Wste Auth | Karen Stewart | (717)246-3486 | GSX Services | (600)638-4440 | 62000.00 | 9250 gals | 560 |
| Pennsylvania | York Cnty | 10/09 /86 | LWV/Sld Wste Auth | Karen Stewart | (717)246-3486 | GSX Services | (800)638-4440 | 50000.00 | 11000 gals | 558 |
| Pennsylvania | York Cnty | 10/15 /87 | County | Bill Ehrman | (717)845-1066 | GSX Services | | | 275 drums | 979 |
| Rhode Island | Cranston | 9/22 /84 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | | | 169 |
| Rhode Island | S. Kingston | 9/29 /84 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | | | 175 |
| Rhode Island | Cumberland | 10/13 /84 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | | | 181 |
| Rhode Island | Portsmouth | 10/20 /84 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | | | 176 |
| Rhode Island | Providence | 10/27 /84 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | | | 182 |
| Rhode Island | Pawtucket | 12/12 /85 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 5673.00 | | 89 |
| Rhode Island | Westerly | 12/12 /85 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 4802.00 | | 17 |
| Rhode Island | Middletown | 12/12 /85 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 11164.00 | | 215 |
| Rhode Island | Warwick | 12/12 /85 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 16156.00 | | 304 |
| Rhode Island | N. Kingston | 5/10 /86 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 7285.00 | | 186 |
| Rhode Island | Smithfield | 5/19 /86 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 9057.00 | | 187 |
| Rhode Island | E. Providence | 5/30 /86 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 8561.00 | | 210 |
| Rhode Island | Providence | 11/22 /86 | R.I. D.E.M. | Felix Harvey | (401)277-2797 | McDonald & Watson | (401)942-0200 | 23316.00 | | 425 |
| Rhode Island | Johnston | 9/12 /87 | RI DEM | Felix Harvey | (401)277-2797 | Clean Harbors | | 39200.00 | | 320 |
| Rhode Island | Newport | 9/19 /87 | RI DEM | Felix Harvey | (401)277-2797 | Clean Harbors | | 35800.00 | | 175 |
| Rhode Island | Little Compton | 9/19 /87 | RI DEM | Felix Harvey | (401)277-2797 | Clean Harbors | | 8700.00 | | 45 |
| Rhode Island | Woonsocket | Fall /87 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 23678,00 | | 220 |
| Rhode Island | Charlestown | Fall /87 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 15000.00 | | 160 |
| Rhode Island | Coventry | Fall /87 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 30000.00 | | 180 |
| Rhode Island | Block Island | Fall /87 | State | Alicia Good | (401)277-2797 | McDonald & Watson | | 15000.00 | | 95 |
| South Dakota* | Pierre | 9/08 /86 | Air Qual & Sld Wste | Vonni Kallemeyn | (605)773-3153 | Sunbelt Environ. | (405)348-5080 | 30000.00 | 11223 lbs | 74 |
| Tennessee | Robertson Cnty (3) | Spr. /86 | GSX Services | Bill Clarke | (800)251-1227 | GSX Services | (800)251-1227 | | | |
| Texas | Austin | 4/01 /86 | City | Liz Bodner | (512)499-2550 | Cecos | | 645000.00 | 8470 gals | 450 |
| Texas | Beaumont | 10/04 /86 | Env Qual Cncl | Scott Nicholson | (409)736-2821 | Chem Waste Mgt | (409)736-2821 | | | |
| Texas | Jefferson | 10/11 /86 | Env Qual Cncl | Scott Nicholson | (409)736-2821 | Chem Waste Mgt | (409)736-2821 | | | |
| Texas | Port Acres | 10/18 /86 | Env Qual Cncl | Scott Nicholson | (409)736-2821 | Chem Waste Mgt | (409)736-2821 | | | |
| Texas | Orange | 10/25 /86 | Env Qual Cncl | Scott Nicholson | (409)736-2821 | Chem Waste Mgt | (409)736-2821 | | | |
| Texas | Brazosport | Spr. /86 | Dow Chemical | Marlise Goode | (409)238-2805 | Dow Chemical | (409)238-2805 | 7000.00 | 1700 lbs | |
| Texas | Austin (2 days) | 4/11 /87 | City of Austin | Jim Eldred | (512)499-2834 | GSX Services | (214)942-9228 | | | |
| Texas | Brazosport (3) | 4/11 /87 | DOW Chemical Co. | Marlise Goode | (409)238-2805 | DOW Chemical Co. | (409)238-2805 | 11880.00 | 5596 lbs | 159 |
| Utah | Tooele County | 6/01 /86 | | David Lawrence | (801)882-5550 | USPCI | (405)324-5066 | | | |
| Utah | Salt Lake City | 6/21 /86 | County Health Dept. | Jeff Throckmorton | (801)534-4519 | USPCI | (405)324-5066 | 28000.00 | 1180 gals | 75 |
| Vermont | Hartford (w/NH) | 11/03 /84 | Upper Valley RPC | Victor Jae | (603)643-5672 | NE Marine Contr | (802)879-8800 | 5000.00 | 1100 gals | 110 |
| Vermont | Hanover (NH) | 5/04 /85 | Upper Valley Region | | | NE Marine Contr | (802)879-8800 | 6000.00 | 1175 gals | 111 |
| Vermont | Middlebury | 5/18 /85 | Town | Betty Wheeler | (802)388-4041 | NE Marine Contr | (802)879-8800 | 5000.00 | 1000 gals | 50 |
| Vermont | Lebanon (NH) | 5/03 /86 | Upper Valley Region | Victor Jae | (603)643-5672 | NE Marine Contr | (802)879-8800 | | | |
| Vermont | Rutland | 5/10 /86 | Rutland SWD | James Duhrman | (802)775-6402 | NE Solvents | (617)681-1002 | 13525.00 | 1900 gal | |

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Vermont | Springfield | 5/17 /86 | Sld Waste Dist | Connie Leach | (603)543-1201 | NE Solvents | (617)603-1002 | | | |
| Vermont | Lyndonville | 5/17 /86 | Lyndonville | Charles Browne | (802)748-2373 | NE Marine Contr | (802)879-8888 | 7800.00 | 1155 gals | [illegible] |
| Vermont | Waitsfield/Warren | 10/04 /86 | Town of Warren | Nancy Colby | (802)496-2970 | NE Marine Contr | (802)879-8888 | 3000.00 | 7 drums | 65 |
| Vermont | Rutland County | 5/16 /87 | Rutland County SWD | Jason Dobrean | (802)775-6403 | NE Solvents | (617)603-1002 | 7450.00 | 935 gals | |
| Vermont | S. Windsor Cnty | 5/17 /87 | S. Windsor Cnty | | | NE Solvents | (617)603-1002 | 10000.00 | 1375 gals | 80 |
| Vermont | Rockingham/Weather | 10/24 /87 | NH/VT Sol. Waste Pro | Connie Leach | (603)543-1201 | NE Solvents | (617)603-1002 | | | |
| Virginia | Fairfax Cnty | 10/26 /85 | County | Robin Bird | (703)691-3381 | GSX Services | (919)362-6106 | | | |
| Virginia | Fairfax Cnty | 4 /86 | County | Melanie Pearson | (703)691-2331 | Rollins Env | | | | |
| Virginia | Chesterfield Cnty | 10/04 /86 | County | Susan Craik | (804)748-5079 | GSX Services | (919)362-6106 | | 125 lbs | |
| Virginia | Fairfax County | 5/08 /87 | Fairfax County | Melanie Pearson | (703)691-2331 | GSX | (301)953-9583 | | | 900 |
| Virginia | Fairfax County | 5/30 /87 | Fairfax County | Melanie Pearson | (703)691-2331 | GSX | (301)953-9583 | | | 900 |
| Virginia | Fairfax County | 9/26 /87 | Fairfax County | Melanie Pearson | (703)691-2331 | GSX | (301)953-9583 | | | 700 |
| Virginia | Fairfax County | 10/03 /87 | Fairfax County | Melanie Pearson | (703)691-2331 | GSX | (301)953-9583 | | | 700 |
| Virginia | Portsmouth | 10/10 /87 | S.E. Public Ser.Auth | Jennifer Ladd | (804)420-4700 | GSX | (800)251-1227 | 20000.00 | 2145 gals | 100 |
| Virginia | Norfolk | 10/24 /87 | S.E. Public Ser.Auth | Jennifer Ladd | (804)420-4700 | GSX | (800)251-1227 | | | |
| Washington | Whatcom Cnty | PERM | Health Dist | Dave Bader | (206)676-6724 | | | | | |
| Washington | Thurston Cnty | PERM | Public Works | Sue Davis | | | | | | |
| Washington | Seattle* | Sep. /82 | Chem Processors | Roger Nelson | (206)223-0500 | Chem Processors | (206)223-0500 | | | |
| Washington | Tacoma/Pierce | Sep. /83 | County Hlth Dept | Dave Pierce | (206)591-6571 | | | | | |
| Washington | Kenosha | 5/10 /85 | EPA | | | GSX Services | (800)251-1227 | 11606.00 | 2530 lbs | |
| Washington | Spokane | 6/01 /85 | City | David Marnes | (509)456-2602 | Chem-Safe | | | | 300 |
| Washington | Kent | 9/14 /85 | City Fire Dept | Asst Chief Berg | (206)872-3360 | Chem Processors | | | 180 gals | 66 |
| Washington | Thurston Cnty | 10/05 /85 | Cnty Hlth Dept | Sue Davis | (206)786-5461 | Chem Processors | | | 240 gals | 37 |
| Washington | Bellevue | Sep. /85 | City | Sarah Gray | (206)453-4895 | Chem Processors | | | | 180 |
| Washington | Thurston Cnty | 5/03 /86 | Cnty Hlth Dept | Sue Davis | (206)786-5461 | Chem Processors | | | 1210 gals | 225 |
| Washington | Bellevue | 5/08 /86 | City | Sarah Gray | (206)453-4895 | Chem Processors | | 17000.00 | 950 gals | 160 |
| Washington | Snohomish Cnty | 5/17 /86 | Health Dist | Jeff Dalenbach | (206)259-0693 | Chem Processors | | | 935 gals | 89 |
| Washington | Kenosha | 5/18 /86 | Public Hlth Dept | | | GSX Services | (800)251-1227 | 11606.00 | 2530 gals | |
| Washington | Vancouver | 6/21 /86 | WA Hlth Dept | Gary Dickatt | (206)695-9215 | Chem Processors | | | 220 gals | 39 |
| Washington | Jefferson Cnty | 8/16 /86 | Public Works | Carter Broshin | (206)385-3505 | Chem Processors | | | | |
| Washington | Yakima Cnty | 11/01 /86 | | Mark Medrow | (509)595-4128 | Chem-Safe | | | | |
| Washington | Kent | Spr. /86 | City Fire Dept | Asst Chief Berg | (206)872-3360 | Crosby & Overton | | | 320 gals | 116 |
| Washington | Spokane | Spr. /86 | City | David Marnes | (509)456-2602 | Chem-Safe | | 18505.00 | 2800 gals | 361 |
| Washington | King Cnty | 5/30 /87 | Seattle/King Cnty | | | | | | | |
| Washington | Spokane | 5/30 /87 | City/Sld Wste Mgt | Donnie Kine | (509)458-2286 | Chem Safe Srvce | | | 41 drums | 325 |
| Washington | Bellevue/Kent | 5/30 /87 | | | | Chem. Processors | | | | |
| Washington | Seattle | 5/30 /87 | | | | | | | 110 tons | 4000 |
| Washington | Island Cnty | 6/13 /87 | | Larry Kuerzick | (206)679-7331 | | | | | |
| Washington | Yakima Cnty | 6/13 /87 | Yakima Pub Works | Mark Medrow | (509)575-0386 | Chem Safe Srvce | | | 13 drums | 60 |
| Washington | Yakima Cnty | 6/27 /87 | Yakima Pub Works | Mark Medrow | (509)575-0386 | Chem Safe Srvce | | | 24 drums | 105 |
| Washington | Island Cnty | 9/19 /87 | | Larry Kuerzick | (206)679-7331 | | | | | |
| Washington | Tacoma/Pierce | 9/26 /87 | City/County | Dave Frutiger | (206)591-5544 | Chem Safe Srvce | | | 100 drums | 525 |
| West Virginia | Nitro | 4/01 /85 | Monsanto | Keith Miller | (304)759-4400 | | | | | |
| West Virginia | Kanawha County | 6/06 /87 | Haz. Waste Adv. Comm | Carol Herrick | (304)348-3381 | CECOS | (513)681-5738 | 21000.00 | 825 gals | 105 |
| Wisconsin | Madison | 5/12 /84 | Dept of Public Hlth | Jill Schmidt | (608)266-4843 | Triangle Resources | | 12000.00 | 3400 lbs | 140 |
| Wisconsin | Brown Cnty | 10/01 /84 | Cnty Board Gov't | Carol Haydon | | | | | | |
| Wisconsin | Manitowoc | 5/10 /85 | EPA | Jeff Byers | | GSX Services | (800)251-1227 | 19505.00 | 2,620 lbs | |
| Wisconsin | City of Kenosha | 5/10 /85 | | George Zimmer | (414)656-8170 | GSX Services | (800)251-1227 | | 405 gals | |
| Wisconsin | Madison | 9/07 /85 | Dept of Public Hlth | Jill Schmidt | (608)266-4843 | GSX Services | (800)251-1227 | 15910.00 | 6695 lbs | 550 |
| Wisconsin | Marathon Cnty | 9/14 /85 | County | Tom Wilson | | | | | | |
| Wisconsin | Brown Cnty | 10/12 /85 | Cnty Bnar Gov't | | | | | | | |
| Wisconsin | Outagamie Cnty | 10/12 /85 | Cnty Envir Comm | Dave Muench | | GSX Services | (800)251-1227 | 9433.00 | 1705 lbs | |
| Wisconsin | Waukesha Cnty | 5/10 /86 | Cnty Solid Waste | Karen Fiedler | (414)548-7820 | GSX Services | (800)251-1227 | 13743.00 | 6160 lbs | |
| Wisconsin | Manitowoc | 5/10 /86 | Cnty Sld Waste Dept | Jeff Byers | | | | | | |
| Wisconsin | Portage Cnty | 5/17 /86 | Cnty Solid Waste | John Leatherman | | GSX Services | (800)251-1227 | 19505.00 | 1685 gals | |

# HOUSEHOLD HAZARDOUS WASTE
# COLLECTION PROGRAMS 1981-1987

| STATE | LOCATION | DATE | SPONSOR | CONTACT | PHONE # | HAULER | PHONE # | COST | WASTE | PARTIC |
|---|---|---|---|---|---|---|---|---|---|---|
| Wisconsin | City of Kenosha | 5/17 /86 | City of Kenosha | | | GSX Services | (800)251-1227 | 9000.00 | [illegible] gal.<br>31 ton | |
| Wisconsin | Dane Cnty | 9/06 /86 | Cnty Ener Gov't | Kathy Unertl | (608)266-4500 | GSX Services | (800)251-1227 | | | |
| Wisconsin | Marathon Cnty | 9/13 /86 | Solid Waste | | | | | | | |
| Wisconsin | Eau Clair Cnty | 9/20 /86 | Solid Waste | Mel Erickson | (715)834-5055 | GSX Services | | | | |
| Wisconsin | Winnebago Cnty | 10/11 /86 | Solid Waste | | | | | | | |
| Wisconsin | Outagamie Cnty | 10/11 /86 | | Steven Golubic | (414)735-5148 | | | | | |
| Wisconsin | Ozaukee Cnty | 4 /87 | | Gary Kohler | (414)284-5746 | Aquatech | | | | |
| Wisconsin | La Crosse Cnty | 5 /87 | | Tim Goodman | (608)785-9572 | | | | | |
| Wisconsin | City of Kenosha | 5 /87 | | George Zimmer | (414)656-8170 | | | | | |
| Wisconsin | Brown Cnty | 5 /87 | Brown Cnty | Mike Donatt | (414)436-3327 | Chem Waste Mgt | | 12000.00 | | |
| Wisconsin | City of Sheboygan | 5/30 /87 | City of Sheboygan | Robert Kuhlmann | (414)459-3366 | E&K Haz Waste | | 40000.00 | | 152 |
| Wisconsin | Eau Claire Cnty | 9/19 /87 | Cnty of Eau Claire | Hal Erickson | (715)839-5044 | GSX Services | (800)251-1227 | | | |
| Wisconsin | Marathon Cnty | 9/27 /87 | Cnty of Marathon | Jim Pellitteri | (715)847-5000 | GSX Services | (800)251-1227 | | 114 drums | |
| Wisconsin | City of Madison | 10/03 /87 | City of Madison | Jill Schmidt | | Chem Waste | | | | 15 |
| Wisconsin | Waukesha Cnty | 10/24 /87 | Cnty of Waukesha | Karen Fiedler | (414)548-7820 | | | | | |

# Appendix V

# Household Hazardous Waste Collection Program Report Form

## HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM

## REPORT FORM

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This form has been developed to track programs nationally in order that future programs may profit from the expertise of those who already implemented collection programs. If your community has held a program, please complete this form and submit it to the address listed at the end. Thank you.

Location(s) of collection program: (shopping mall, parking lot, government lot, private lot, school yard, etc.) ____________

______________________________

Date(s) program held ______________________________

Is your program an ongoing permanent one? ____________________

______________________________

Sponsor: Name of Organization ____________________

Address ____________________

____________________

Contact Person ____________________

Telephone ____________________

Co-sponsors:

How long ago was your last program held? ____________________

Hazardous Waste Management Firm:

Name ____________________

Address ____________________

____________________

Contact Person ____________________

Telephone ____________________

Costs: Operational Expenses (Expenses for sorting, packaging, transporting and disposing of the waste)________________________

Education/Publicity costs____________________________

Other_____________________________________________

Source(s) of funding: (Please specify which department of local government funded your collection and how funding was obtained. Example: County Public Works through an increase in trash pickup.)__________________________________________

How was liability handled?______________________________

Waste Collected:

| Types of waste (DOT Classified) | Quantity (gallons or number of drums) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | |

Number of households in service area____________________________

Number of households participating______________________________

Average amount of waste collected per participating household___

________________________________________________________________

Education and publicity program:

| | What kind | How was it distributed | How often |
|---|---|---|---|
| Material Developed: | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Did you use a radio or T.V.? Yes _____ No _____

Length of time before collection day that:

the idea was conceived______________________________

the money was allocated______________________________

that the education program began______________________

the publicity began__________________________________

Special problems:

Send to: Dana Duxbury
Center for Environmental Management
Tuft University - Curtis Hall
474 Boston Avenue
Medford, MA 02155

If you have any questions about how to complete this form, telephone (617) 381-3486.

# Appendix VI

## Bibliography on Household Hazardous Wastes

# Bibliography
# on Household Hazardous Wastes

October, 1987

Prepared by the Center for Environmental Management, Tufts University - Curtis Hall, 474 Boston Avenue. Medford, MA 02155

Note:

1. The bibliography listed is a compilation of a) the bibliography listed in "Alternatives to Landfilling Household Hazardous Waste," a publication by Gina Purin, Golden Empire Health Planning Center, 2100 21st Street, Sacramento, CA 95818 b) a bibliography put together by the Center for Environmental Management for the Environmental Protection Agency on Household Hazardous Waste. Brochures and other studies collected by the Center for Environmental Management are also included.

2. The bibliography list has been split into three parts I) General Materials II) State Reports and Brochures on Household Hazardous Waste III) Household Hazardous Waste Materials Bibliography.

## Bibliography Contents

Page

I General Materials.......................................... 1

II State Reports and Brochures on Household Hazardous Waste.... 9

III Household Hazardous Waste Materials Bibliography by Fate.... 16

# GENERAL MATERIALS

## General Materials

Alternatives to Landfilling Household Hazardous Waste. Golden Empire Health Planning Center, 2100 21st Street, Sacramento, CA 95818. Highlights options to landfilling households

Art Hazards Newsletter is available from the Center for Occupational Hazards, Inc., 5 Beekman Street, New York, NY 10038, (212) 227-6220. Provides information on hazards relating to various arts and crafts that include painting, theater, photography, silk screen, stain glass, ceramics, etc.

Artist Beware (1979), by Michael McCann, Watson-Guptill Publications, New York. An excellent handbook for artists, craftsmen, and home hobbyists. Explains the health risks associated with numerous chemical products. Discusses safety procedures, first aid, and recognition of poisoning. Individual chapters on painting, printmaking, ceramics, glass-blowing, enameling, sculpture, metalworking, photography, crafts, and children's art.

Assessment of Household Exposure to Common Consumer Products (1986) Donna Eisenhower, Ph.D., Joseph S. Carra, Mary Frankenberry, and Karen Hamerstrom, published by WESTAT, 1650 Research Boulevard., Rockville, MD 20850-3129, (301) 251-1500. This report is the first attempt to collect consumer information for exposure assessment through a telephone survey. "Engineering judgement" is compared to the empirical data gathered from these surveys.

Bug Busters: Getting Rid of Household Pests Without Dangerous Chemicals (1985) by Bernice Lifton, McGraw-Hill Book Company. The book describes safe, effective alternatives to chemical pesticides.

Bury It In The Back: Hazardous Waste Disposal of Used Automobile Oil is available from MASSPIRG Education Fund/Publications, 37 Temple Place, Boston, MA 02111, (617) 423-1796. Reports on the effects of improper disposal of waste oil. Focuses on the do-it-yourself oil changer and the retail outlets where the automotive oil is bought.

Chemical Education for Public Understanding Project (CEPUP) A series of activity-oriented science modules for use in junior high/middle shool science. Four modeles currently being piloted: Threshold Limits, Chemical Survey, and Risk Comparison; additional modules are in preparation. Contact:

Dr. Herbert D. Thier
Lawrence Hall of Science
University of California at Berkeley
Berkeley, California 94720
(415) 642-8718

Chemical Hazards in the Home is available through Golden Empire Health Planning Center, P.O. Box 162997, Sacramento, CA 95816. A series of four information brochures addressing pesticides, solvents, household cleaners and polishes, and safety equipment.

Clinical Toxicology of Commercial Products, Robert Gosselin et.al. Baltimore: Williams and Wilkins Company. Lists 3000 chemical ingredients widely used in commercial products; gives toxicity information on each. Also has a trade-name index for 17,000 products which identifies manufacturers, lists ingredients for each product, and specifies toxic components. This reference source should be found in a public library.

Cockroach Clean-up Tour (1983) by Kathleen Letcher Cowles, produced by the John Muir Institute, 20 W. High Street (WO), Morganstown, WV 26505, (304) 296-2855. An elementary school teaching packet that includes lesson plans, posters, a take-home booklet, a filmstrip/cassette tape, and adequate background materials to make any teacher an expert on environmentally sound pest control.

Common Sense Pest Control Quarterly is available through the Bio-Integral Resource Center, P.O. Box 7414, Berkeley, CA 94707. Designed to give readers access to the wide variety of safer alternatives available for managing insect, weed, rodent, and plant pests found in the home, on the human body, on pets, in the garden, the workplace, and the community.

"Disposal - Do It Right." Household Products Disposal Council, 1625 Eye Street, NW, Suite 500, Washington, DC 20006, 202-659-5535. Information developed by the manufacturers of certain household hazardous waste products.

Does Your Business Produce Hazardous Waste? Many Small Businesses Do. (June 1985) US Environmental Protection Agency (EPA), Office of Solid Waste and Emergency Response, Washington, DC 20460. EPA 530-SW-010.

Encyclopedia of Chemical Trademarks and Synonyms by H. Bennett. Published by the Chemical Publishing Company, Inc., NY.

The Encyclopedia of Natural Insect and Disease Control (1985) is available from Rodale Books, 33 East Minor Street, Emmaus, PA 18049. Offers hundreds of ways to control insect pests naturally, without the use of harsh chemicals. Also includes color photos and drawings of troublesome insects, habits and behavior of natural creatures, methods of attracting pest-eating beneficials, ways to develop an integrated pest control strategy and more.

ERIC Clearinghouse for Science, Mathematics, and Environmental Education
Teaching about Hazardous and Toxic Materials, selected by John F. Designer and Marylin Lisowski. A compilation of activities and lesson plans from various sources in the ERIC database, given a consistent format and divided into K-3, 4-6, 7-9, and 10-12 grades. Includes a bibliography, a copy of which is attached. $12.50.

ERIC/SMEAC
The Ohio State University
1200 Chambers Road, 3road Floor
Columbus, Ohio 43212

Evidence of Inappropriate Disposal of Hazardous Waste From Small Quantity Generators (1984), Solid waste technology memo No. 11 by L. Jackson Russell, N. Knappenberger. Available from Association of Bay Area Governments, P.O. Box 2050, Oakland, CA 94604, (415) 464-7900.

Federation of Ontario Naturalists
A resource kit called Hazardous Waste, "designed for grades 12 to 13, but is easily adaptable for grades 7 to 9." This takes the form of box full of a diverse assortment of resource materials, such as pamphlets from various sources. It also includes lesson plans. $45 plus $5 postage and handling. Contact:

The Federation of Ontario Naturalists
355 Lesmill Road
Don Mills, Ontario
Canada, M3B 2W8

Handbook of Industrial Toxicology, (1976) by E.R. Plunkett, M.D., Chemical Publishing Co., Inc., New York. For each chemical listed, gives synonyms, description of properties, common uses, toxicity, treatment, and safety measures.

Handbook of Toxic and Hazardous Chemicals and Carcinogens, second edition, (1985) by Marshall Sittig, Noyes Publications, Park Ridge, NJ. Presents concise chemical, health and safety information on nearly 800 toxic and hazardous chemicals which includes a description of the chemical, code number, DOT designation, synonyms, potential exposure, incompatibilities, permissible exposure limits in air, permissible concentrations in water, disposal methods, personal protective methods and more.

Hazardous Chemicals Data Book (1980) by G. Weiss. Published by Noyes Data, Park Ridge, NJ.

Draft Copy of Hazardous Waste Curriculum (1986) by Sue Lacy, Ohio Public Interest Campaign, 1501 Euclid Avenue #599, Cleveland, OH 44115, (216) 861-5200. The Industrial States Policy Center of Ohio, in cooperation with Ohio Department of Education and the University of Michigan's School of Natural Resources, have developed a program which institutes an awareness of the hazardous materials/waste problem on the local, state, national, and global levels. It provides guidelines for students to take an active role in developing and implementing local solutions.

Household Hazardous Waste Management: A Survey of selected programs in North America and Europe by Jennie S. Goldberg, (January 1987), Water Quality Division, Municipality of Metro Seattle, WA.

Hazardous Wastes from Home is available from the Enterprise for Education, 1320 A Santa Monica Mall, Santa Monica, CA 90401. An extremely colorful magazine that makes for easy reading. Among the topics covered include type of wastes considered hazardous and suggested disposal methods, reduction and recycling opportunities, and sources to contact for additional information.

Hazardous Waste - Waste You Should & Shouldn't Do. Water Pollution Control Federation, 601 Wythe Street, Alexandria, VA 22314-1994. Colorful pamphlet with household hazardous waste disposal chart.

Home Safe Home is available through the Western Washington Toxics Coalition, 4512 University Way NE, Seattle, WA 98105, (206) 632-1545. Offers a wealth of information on cleaning and hobby supplies, office supplies, and pesticides. Also includes a section of safety equipment that suggests the specific type of protective gear needed when exposed to a variety of toxic products found in household and hobby supplies.

House Dangerous. (1987) Ellen J. Greenfield. Blue Cliff Editions, Inc. A paperback book on indoor pollution in your home and office and what you can do about it.

Household Hazardous Waste Collection Program Information. (November 1986). Center for Environmental Management, Tufts University, 474 Boston Avenue, Curtis Hall, Medford, MA 02155. Summary of EPA's National Household Hazardous Waste Collection Program conference and background material developed by CEM, 617-381-3486. $11.00 includes postage and handling.

Household Hazardous Waste: Solving the Disposal Dilemma (1984), by Gina Purin, et.al., Golden Empire Health Planning Center, P.O. Box 162997, Sacramento, CA 95816. A comprehensive "how to" handbook that discusses the implementation of collection programs for residentially generated hazardous waste. Drawing on the collective experience of programs conducted nationally, the handbook discusses interest areas that include various program design options, generator responsibilities, permits/variances, manifesting and transporting the waste, liability, financing a program and publicity efforts. An extensive resource section is included in the appendices.

Household Hazardous Waste Disposal Project Summary by David Galvin and Susan Ridgley is available from METRO, Municipality of Metropolitan Seattle, Exchange Building, 821 Second Avenue, Seattle, WA 98104, (206) 684-1216. Provides a comprehensive overview of the household hazardous waste issue; reviews the legal framework which controls the contents, labelling and disposal of household toxics; and examines four classes of consumer products for their contents, health effects, and environmental fate. The categories are pesticides, paint products, household cleaners, and automotive products. (Also check the Resources - General Section - for Susan's latest report: Hazardous waste from Minnesota Households - The Final Report of the Household Hazardous Waste Pilot Collection Project.)

Household Hazardous Waste Wheel is available from Environmental Hazardous Management Institute, P.O. Box 283, 137 High Street, Portsmouth, NH 03801, (603) 436-3950. A spin of the wheel tells you the types of hazardous waste found in the home, the probable hazardous chemical constituents of these wastes, associated hazards, non-toxic alternatives, preferred disposal options, and more.

"How Hazardous are Municipal Wastes?" (March 1983). Article in American City and County, pg. 41.

The Implications of Behavioral Aspects on the Production and Discard of Household Hazardous Wastes (1985) by D.C. Wilson. Published as a thesis, M.A., University of Arizona, University Microfilms, Ann Arbor, MI.

Industrial States Policy Center
To be published in August 1987. Teachers guide with 35 activities, divided into six units:

Introduction
Hazardous materials in the home
Hazardous materials in the school
Hazardous materials in the community
Community action projects
Skill building (group process skills)

Title and price not set yet, about $10. Apply for more information to:

Industrial States Policy Center
691 North High Street
Columbus, OH 43215
(614) 224-4111

Information on Disposal Practices of Generators of Small Quantities of Hazardous Waste is available from the U.S. General Accounting Office, Document Handling and Information Services Facility, P.O. Box 6015, Gaithersburg, MD 20760, (202) 275-6241. Provides information on Federal and State efforts to control disposal practices of small quantity generators. Also discusses the extent to which occupational safety and health and groundwater contamination problems are caused by the disposal of hazardous waste by small quantity generators.

Living With Insects in the Big City (1987) by Diane Bush and Steve Dreistadt for Citizens for a Better Environmental, 942 Market Street, Suite 505, San Francisco, CA 94102, (415) 841-6163. This curriculum will introduce students and teachers to the basic concepts of intergrated pest management and is intended for students in kindergarden through 3rd grades. Although the teaching units have been developed to follow a sequence of concepts dealing with non-toxic pest control, they can also be used separately as parts of any environmental or natural science curriculum. A slide show is also available to accompany the curriculum.

Making the Switch: Alternatives to Using Toxic Chemicals in the Home (1986) is available through Golden Empire Health Planning Center, P.O. Box 162997, Sacramento, CA 95816. This information consumer guide discusses methods for reducing exposure to some toxics in the home environment, identifies products that contain toxic chemicals, and addresses problems associated with inadequate labelling and indiscriminate disposal practices. Offers many safer alternatives to using household products that contain toxic substances.

The Merck Index: An Encyclopedia of Chemicals and Drugs (1968), by P.G. Stecher et.al., Merck and Company, Inc. Rahway, NJ. Describes toxic effects and common uses of 10,000 chemicals. Has a poison-control center list, first-aid information, and a cross-index of chemical names and formulas.

"The Method to Our Madness" (1984) by W.W. Hughes. Published in American Behavioral Scientist 28(1): 41-49.

The Natural Formula Book for Home and Yard edited by Dan Wallace is available from Rodale Press, 33 East Minor Street, Emmaus, PA 18049, (215) 967-5171. Constraints over 400 natural formulas to help you live healthier, safer, and more economically independent. Also includes receipes for all natural convenience foods. Formulas given for all purpose cleaners, laundry needs, natural hygiene and beauty products, garden products, and a number of other areas.

Non-Toxic and Natural: How to Avoid Dangerous Everyday Products and Buy or Make Safe Ones by Debra Lynn Dadd is available from Non-toxic Lifestyles, Inc., Box 390, Inverness, CA 94937, (415) 663-1685. In this heavily researched and up-to-date book, author Debra Lynn Dadd rates thousands of items in such categories as food, beauty aids, office supplies, building materials, household items, and clothing. She tells what is in them, how they can harm us, and how to replace them with store bought, mail order, or homemade products that are as effective but safe. Non-toxic Lifestyles also offers a subscription newsletter. Debra L. Dadd's newest publication is called The Non-toxic Home: Protecting Yourself and Your Family from Everyday Toxics and Health Hazards.

Not A Pretty Picture: Art Hazards in California Public Schools (1984) by Ron Pembleton. Published by CALPIRG, 46 Shattuck Square, #11, Berkeley, CA 94704, (415) 642-9952. This book discusses health hazards in the arts and makes recommendations for safer practices.

Pesticides and You and Pesticide Safety: Myths and Facts are available from the National Coalition Against the Misuse of Pesticides (NCAMP), 530 Seventh Street, SE, Washington, DC 20003, (202) 543-5450. Pesticides and You is a newsletter addressing the use and misuse of pesticides and provides valuable information to anyone interested in various aspects of economic poisons. Pesticide Safety: Myths and Facts dispels myths of safety behind the registration of pesticides. NCAMP also provides a number of alternatives for commonly used pesticides.

Pesticides in Lawn Contract Maintenance and Healthy Lawns Without Toxic Chemicals are available from the Rachael Carson Council, 8940 Jones Mill Road, Chevy Chase, MD 20815, (301) 652-1877. The books respectively outline the most commonly used pesticides in lawn maintenance and identifies their health and environmental effects; and, provides an ecological approach to control of tuft disease.

Poison Palattes: A Study of Toxic Art Supplies in Massachusetts Schools is available from MASSPIRG Education Fund/Publications, 37 Temple Place, Boston, MA 02111, (617) 423-1796. Lists some potentially hazardous products and also offers recommendations on a number of issues that include product labelling, banning dangerous items from schools and teacher training.

Philip T. Gidley: Exercises in Hazardous Waste Problem Solving (1984) by Paul D. Bush, published in the Dangerous Properties of Industrial Materials Report, Hop Brook Farm, New Salem, MA 01355.

School Science Laboratories: A Guide To Some Hazardous Substances, is available from Ken Giles, U.S. Consumer Product Safety Commission, 5401 Westbard Avenue, Bethesda, MD 20207, (301) 492-6580. Supplements the National Institute on Occupational Safety and Health's (NIOSH) Manual of Safety and Health Hazards in the School Science Laboratory. Identifies certain potentially hazardous substances in use in many school laboratories and provides a concise inventory to enable science instructors to take the initiative in providing for proper storage, handling, use and removal of extremely hazardous materials. Provides lists of explosives, carcinogens, highly toxic, and/or corrosive or irritant chemicals.

Sleuth: Educational Activities on the Disposal of Household Hazardous Waste. Curriculum is available from: Toxicant Program/Household Hazardous Waste.

Toward a Comprehensive Program For Management of Household Hazardous Waste in Massachusetts. Environmental Institute, University of Massachusetts, Amherst, MA 01003, (413) 545-2842. 296-page book. $8.00. Also available for $1.25 is an Annotated Bibliography.

Why Your House May Endanger Your Health (1980) by Alfred V. Zamm, M.D. with Robert Cannon. Available in Bookstores. This book brings about an awareness of household items contributing to toxic reactions. The first part shows what the average home is like and the myriad of substances to which we are exposed to indoors. The second part discusses what to do about it and the third part is designed for the person who is moving to a new home, building a new home, or renovating one.

## State Reports and Brochures on Household Hazardous Waste

### California

Household Hazardous Waste: Your guide to Safe and Proper Hazardous Waste Disposal. Brochure prepared by The Department of Environmental Health Services, County of San Bernardino, CA.

The World Is Full of Toxic Waste. Your Home Shouldn't Be. (619) 235-0281. Environmental Health Coalition, Household Toxics Disposal Project, P.O. Box 8426, San Diego, CA 92101. Flyer on toxic products in the home, their effects and proper disposal. Also, the Final Report of the 1984 project that included a survey, an educational program, and free disposal services in eight areas within the County of San Diego and the County of San Diego. Free.

The Disposal of Hazardous Waste by Small Quantity Generators: Magnitude of the Problem (June 1985) is available from the Association of Bay Area Governments, Metro Center, Eighth and Oak Streets, Oakland, CA 94604. Examines the nature and magnitude of improper disposal of hazardous waste from households in selected San Francisco Bay Area Communities and from small businesses in selected standard industrial classification categories in the San Francisco Bay Area. Also presents alternative means of disposal.

Hazardous Waste in the San Francisco Bay Area: Status Report (1983) by The Association of Bay Area Governments. Solid Waste Technical Memorandum No. 10 by G. Silvermen is available from ABAG, P.O. Box 2050 Oakland, CA 94604, (415) 464-7900.

Alameda County Pilot Collection Program for Household and Small Generators of Hazardous Waste (April 23, 1987) by Emy Chan Meiorin, is published by the Association of Bay Area Governments, P.O. Box 2050, Oakland, CA 94604-2050, (415) 464-7941. This publication discusses collection programs held in the San Francisco Bay Area through from their start-up in 1983. Tables compare collection program financing, participation rates, waste generation rates, etc.

Work Plan for a Toxic/Hazardous Waste Management Plan for Small Quantity Generators: North Hollywood Pilot Study is available from the Southern California Association of Governments, 600 South Commonwealth Avenue, Suite 1000, Los Angeles, CA 90005, (213) 385-1000.

### Connecticut

Hazardous Products in the Home. Department of Environmental Protection, State Office Building, Hartford, CT 06106. Flyer on product use and disposal and chart of common hazardous products, their potential hazard and disposal methods.

Household Hazardous Waste in Connecticut - Report to the General Assembly. Report will be available for public distribution by December 1987. Contact Leslie Lewis, Citizen Information Unit, Department of Environmental Policy, 165 Capitol Avenue, State Office Building, Hartford, CT 06106, (203) 566-3489.

How to Organize a Community Collection Day. Department of Environmental Protection (see above). 30-page booklet originally prepared by the Pioneer Valley Planning Commission of Springfield, MA, and the Western Massachusetts Coalition of Safe Waste Management. (1985). Leslie Lewis, (203) 566-3489.

## Florida

Amnesty Days Information Packet. Department of Environmental Regulation, Bureau of Operations, 2600 Blair Stone Road, Tallahassee, FL 32301, (904) 488-0190. Information kit on the 1984 state-sponsored collection. Brochures, news releases, press clippings, plan, and summary report. Free

## Idaho

Hazardous Waste in This House? Brochure prepared by League of Women Voters, Moscow, ID.

## Maine

The World is Full of Toxic Waste. Your home shouldn't be. Brochure prepared by Natural Resources Council of Maine.

## Maryland

Feasibility Study of Special Collection of Household Hazardous Waste: (January 1986). Prepared by the Maryland Environmental Service, 2020 Industrial Drive, Annapolis, MD.

## Kansas

Final Report: Kansas Household Hazardous Waste Collection Days Project. (February 1987). Prepared by Kansas Department of Health and Environment. Forbes Field, Topeka, KS 66620-7200, (913) 862-9360.

## Massachusetts

A Guide to the Safe Use and Disposal of Hazardous Household Products. Metropolitan Area Planning Council, 110 Tremont Street, Boston, MA 02108, (617) 451-2770. 50-page handbook on common household products with tips on a collection project and a bibliography.

Household Hazardous Wastes Collection Project: A How-to Kit. (1981).Natural Resources Committee, League of Women Voters of Lexington, Massachusetts, Box 233, Lexington, MA 02173. Included in kit.

How Many of Our Common Household Products Are Hazardous? Metropolitan Area Planning Council, 110 Tremont Street, Boston, MA 02108, (617) 451-2770. Four-page flyer, well illustrated. How to get rid of products. Substitutes for common products. Free.

"Results of a Regional Household Hazardous Waste Collection Program in Barnstable County, Massachusetts." David S. Blackmar, Scott W. Horsely, Lorraine Segall, Alan Woolf, Hazardous Waste, Vol. 1, No. 1. Detailed description and critique of the 1983 collection on Cape Cod.

Household Hazardous Waste (1984), by Curtis and Anderson for Pioneer Valley Planning Commission and Western Massachusetts Coalition for Safe Management, Bureau of Solid Waste Disposal.

Beginning At Home: Tackling Household Hazardous Waste is an 18-minute video available from the Massachusetts League of Women Voters, 8 Winter Street, Boston, MA 02108, (617) 357-8380. Beginning with street interviews concerning the proper disposal of household toxics, the program progresses to wastes being dumped and the establishment of household collection programs as a safer disposal alternative. Wise buying of products is highlighted.

Household Hazardous Waste Information Kit. League of Women Voters of Massachusetts, 8 Winter Street, Boston, MA 02108, (617) 357-8380. A comprehensive kit on how to run a household hazardous waste collection. For sale. $15.00.

Household Hazardous Wastes: Everyone's Problem. League of Women Voters of Massachusetts, 8 Winter Street, Boston, MA 02108, (617) 357-8380. 18-minute slide-tape show. Available for rental or sale.

Household Hazardous Waste: Final Report on Matching Grants Program: Operation Clean Sweep. Report available by December, 1987 contact Barbara Kelley (617) 727-3260, Massachusetts Department of Safe Waste Management, 100 Cambridge Street, 9th Floor, Boston, MA 02202.

### Michigan

Household Hazardous Wastes: Disposal Recommendations. (1984). Michigan State University Cooperative Extension Service. Extension Bulletin E-1782. 25 cents. 13-page brochure. Guidelines on buying, storing, and use. Special sections on pesticides, paints, and automotive products.

Michigan Household Hazardous Substance Handbook. Published by the Ecology Center of Ann Arbor, 417 Detroit Street, Ann Arbor, MI 48104, (313) 761-3186. The handbook is designed to serve as a resource for people frequently contacted by the public for information on household hazardous substances and wastes.

## Minnesota

Interim Report #1. The Legislative Commission on Minnesota Resources. Household Hazardous Waste Collection Project. (1985). Susan Ridgley/Steve Lee. Hazardous Waste Disclosure Unit, Hazardous Waste Section, Solid and Hazardous Waste Division, Minnesota Pollution Control Agency, 520 Lafayette Road, Street. Paul, MN 55155, (612) 297-1453. Summary of the six collection projects held in Minnesota in Fall.

Hazardous Waste from Minnesota Households: The Final Report of the Household Hazardous Waste Pilot Collection Project (1987) by Susan Ridgley, available from: MPCA, Division of Solid and Hazardous Waste, 520 Lafayette Road, Street. Paul, MN 55155, (612) 297-1453. This extensive report discusses various methods of collection projects and management opinions available for household hazardous waste. Analyzes public opinion surveys conducted by telephone and at collection sites. Presents data on waste collected at various programs and gives demographics of participants. Also included in the report are collection projects participation rates, a waste frequency analysis, total wastes collected by product type and much more. Report concludes with recommendations for future action and legislation activity.

Final Report: Evaluation of Municipal Solid Waste Incineration Street. Paul, MN: Minnesota Pollution Control Agency.

Natural Resources Research Institute, University of Minnesota. (1987). Feasibility Study on Long-Term Management Options for Used Oil in Minnesota-Draft Final. Crystal, MN: Waste Management Board.

## North Carolina

Household Hazardous Waste: Collection and disposal options for North Carolina Communities (1987). Outlines procedures on how to organize a collection program. Contact Mary Beth Edelman, Institute for Environmental Studies, 311 Pittsboro Street - 256H, University of North Carolina, Chapel Hill, NC 27514, (919) 966-3332.

## New Hampshire

The Exter Plan (1980) is available from Gidley Laboratories, Inc., Chemical and Environmental Sciences, Fairhaven, MA. A hazardous waste management plan created for the town of Exeter, New Hampshire.

Hazardous Material in Your Home - Brochure by the University of New Hampshire, Cooperative Extension Service and the New Hampshire Department of Environmental Services.

## New Mexico

Albuquerque Hazardous Waste Collection Project. Albuquerque Environmental Health Department, Environmental Services Division, P.O. Box 1293, 924 Park Avenue, SW, Albuquerque, NM 97103, (505) 766-7434.

## New Jersey

New Jersey Household Hazardous Waste Study: Draft copy available - Susan Boyle, Assistant Director, New Jersey Hazardous Waste Facilities Siting Commission, 28 West State Street, #614, Trenton, NJ 08160, (609) 292-1459. Free Copies Available.

## New York

Household Hazardous Waste in New York: A Conceptual Framework for Policy Development: Submitted to New York State Environmental Facilities Corporation. by William T. Brina, Jr., July, 1987. (In household paper. Not available for public distribution)

## Ohio

Who, Me? Hazardous Waste in My Home? Brochure prepared by League of Women Voters of Toledo - Luca County. Toledo, Ohio.

## Oregon

Small Quantity Collection and Storage Facilities in Oregon for Hazardous Waste (1982) is available from the Resource Technology Corporation, 20480 Pacifica Drive, Suite G, Cupertino, CA 95014. Private citizens and small businesses in Oregon do not have a system available to conveniently and economically dispose of their hazardous wastes in an environmentally sound manner. This report provides a basic design for a small quanitity collection/storage facility to accommodate this need.

## Pennsylvania

York County Household Hazwaste Collection Days. York County Solid Waste and Refuse Authority, York, PA. A project of the York County Solid Waste and Refuse Authority, League of Women Voters of Greater York, and Concerned Citizens. Summary of the collection days held in October 1985 in York Pennsylvania. $10.00.

## Rhode Island

How to Handle Household Hazardous Products: Brochure prepared by Rhode Island Department of Environmental Management.

## Vermont

Air & Land - a quarterly report published by Vermont Agency of Environmental Conservation, Montpelier, VT 05602, (802) 828-3395. "The Domestic Side of Hazardous Wastes," Winter, 1985 issue. Free.

## Virginia

Household Hazardous Waste in Virginia. (January 1986). A Guide for Local Governments. Virginia Polytechnic Institute & State University, Hazardous Waste Management Project, College of Architecture and Urban Studies, Blacksburg, VA 24061, (703) 961-7508. Updated version to this guide will be available by February 1988.

## Tennessee

An Indoor Air Quality Study of 40 East Tennessee Homes (1985) by A.R. Hawthorne, R.B. Gammage, and C.S. Dudney, Health and Safety Research Division, Oak Ridge, TN. Over a one year period, measurements of indoor air pollutants (combustion gases, formaldehyde, volatile organics, particulate matter, and radon) were made in 40 homes in east Tennessee.

## Washington

Hazardous Waste in My Home? Tacoma-Pierce County Health Department, Environmental Health Division, Tacoma, WA. Seven-page brochure listing products and non-toxic alternatives.

Household Hazardous Waste Disposal Project - Summary Report. By David V. Galvin and Susan M. Ridgley. METRO, Municipality of Metropolitan Seattle, Exchange Building, Metro Mailstop 81, 821 Second Avenue, Seattle, WA 98104, (206) 447-5875. December 1982 report of Seattle's collection. Reviews legal framework. Examines pesticides, paint products, household cleaners and automotive products for their content, health effects, and environmental fate.

Public Opinions and Actions. Report C of the Household Hazardous Waste Disposal Project. (August 1982). Metro Toxicant Program #1, David Galvin, Toxicant Planning Section, Municipality of Metropolitan Seattle; Leonard M. Guss and Judith L. Leraas, Leonard Guss Associates, Inc. A study revealing public awareness and attitudes in the Seattle area on hazardous wastes.

Toward Hazardless Waste. A Guide for Safe Use and Disposal of Hazardous Household Products. (September 1985). By Sally Toteff, Water Quality Division, Municipality of Metropolitan Seattle and Cheri Zehner, Environmental Health Specialist, Seattle-King County Department of Public Health. METRO, Municipality of Metropolitan Seattle, Exchange Building, Metro Mailstop 81, 821 Second Avenue, Seattle, WA 98104, (206) 447-5875. Inexpensive booklet designed to help consumers make decisions about safe use and disposal of household products.

Washington State Department of Ecology, (1986). Draft Local Hazardous Waste Planning Guidelines. Olympia, WA: Solid and Hazardous Waste Program, Department of Ecology.

Household Chemicals: The Hidden Hazards: Brochure prepared by the Department of Ecology, State of Washington.

Washington D.C.

Hazardous Waste Exchange, No. 5. League of Women Voters Education Fund, 1730 M Street., NW, Washington, D.C. 29935, (202) 429-1965. Six-page brochure on hazardous materials with a section on households. Free.

Wyoming

Survey and Analysis of Hazardous Waste Generation and Management in Wyoming (1980) is available from David A. Finley, State of Wyoming, Department of Environmental Quality, Solid Waste Management Program, Equality State Bank Building, 401 West 9th Street, Cheyenne, WY 82002, (307) 777-7752.

Wisconsin

"Chemical Hazards in the Home." Nitsa Benson, Agricultural Bulletin, (July 1979). University of Wisconsin Extension, Madison, WI 53706. Brochures on solvents, pesticides, and cleaners and polishes.

Hazardous Waste in your Home - Here's what you should do. University of Wisconsin - Madison - Cooperative Extension Service - Brochure.

Don't Poison the Ones you Love - Brochure by Clean Sweep, a cooperative effort of the City of Madison, Citizens for a Better Environment, and the Department of Natural Resources.

International

The United States/Mexico City Household Refuse Comparison (1985) by W.L. Rathje, M.D. Reilly, and W.W. Hughes. Report to the Solid Waste Task Force, American Paper Institute, Washington, D.C.

A Grand Tour of Europe's Hazardous-Waste Facilities (1984) by Bruce Piasecki and Gary A. Davis, published in Technology Review. This article compares methods of treating and disposing of toxic waste in West Germany and Denmark to that of the United States.

International Perspectives on Hazardous Waste Management (1987) edited by William S. Forester and John H. Skinner. A report from the International Solid Wastes and Public Cleansing Association (ISWA) Working Group on Hazardous Wastes.

Household Hazardous Waste Management: A Survey of selected programs in North America and Europe by Jennie S. Goldberg, January 1987, Water Quality Division, Municipality of Metro Seattle, WA

## Household Hazardous Waste Materials Bibliography by Fate

### Waste Water Treatment

Cooley R. et. al. 1984. Toxicant Pretreatment Planning Study Report A2: Collection System Evaluation. Municipality of Metro Seattle, Seattle, WA.

Trace Organic Removals in a Large Septic Tank by Foppe B. DeWalle, et. al., Department of Environmental Health, University of Washington, Seattle, WA 98195. Assesses environmental impact of septic tanks.

Cesspool Cleaner Study (1980) is prepared by Aldo Andreoli and Royal Reynolds, Suffolk County, Department of Health Services, Hauppauge, NY. Findings indicate that the organic solvents used for cleaning subsurface waste water disposal systems present a threat to ground water supplies.

Ground-Water Pollution By Septic Tank Drainfields (1980) by Foppe B. DeWalle and Russell M. Schaff, Journal of the Environmental Engineering Division, Proceedings of the American Society of Civil Engineers, Vol. 106, No. EE3, June, 1980.

Groundwater Quality Protection in Oakland County: A Sourcebook for Teachers (1984). Published by the East Michigan Environmental Action Council, One Northfield Plaza, Troy, MI 48098. Information provided in the source book includes characteristics of groundwater, the water cycle and uses of groundwater. Addresses household hazardous materials from both a safety and groundwater standpoint.

Sources of Toxic Compounds in Household Wastewater (1980), by Stephen Hathaway, USEPA, Office of Research and Development of the Municipal Environmental Research Lab, U.S. Environmental Protection Agency, Cincinnati, OH 45268.

Performance Evaluation of Small Community On-Site Sewage Treatment Systems Using Sub-Surface Effluent Disposal by F.B. DeWalle, et.al., Department of Environmental Health, University of Washington, Seattle, WA 98195. Evaluated the performance of 415 small community on-site sewage disposal systems using subsurface effluent disposal in the state of Washington.

Gall J. and Houck D. (1984): Source controls: Pretreatment evaluation - Toxicant Pretreatment Planning Study - Toxicant Study A4, Municipality of Metro Seattle, Seattle, WA.

Egenhouse R. and I. Kaplan - Extractable Organic Matter in Municipal Waste Water - Engineering Science and Toxics Vol. 16, pg. 180-186, (1982).

## Landfill Leachates and Emissions

Toxic Substances Emitted by MSW Landfills. (August, 1987). Prepared by Alvin J. Greenberg Ph.D., Kyle Bishop, Risk Sciences Associates, Mill Valley, CA for the Friends of Recycling of the Environment, San Marcos, CA and North County Resource Recovery Associates, San Marcos, CA,

Hazardous Pollutants in Class II Landfills: (December 1986). Report by the South Coast Air Quality Management District.

Study of Vinyl Chloride Formation at Landfill sites in California: Final Report January 1987. Prepared for the State of California by the California Air Resource Board.

Volatile Organic Compounds as Indicators of MSW Leachate Contamination: Sabel G.V. and Clark T.P., MPCA. Partial support for study by USEPA.

Nelson, B.R. and P.R. Book. (1986). Monitoring for Volatile Organic Hydrocarbons at Minnesota Sanitary Landfills. Presented at the Ninth Annual Madison Waste Conference, September 9-10, 1986, University of Wisconsin - Madison.

Report on Survey of Consumer Products Containing or Suspected of Containing Harmful Organic Chemicals and Having the Potential of Contaminating the Groundwater of Nassau County New York (May 1979) by Susanne L. Mackay, et.al., Bureau of Wastewater Management, Nassau County, Department of Health.

Leachate Treatment Options (1981) by M.P. Scott in Solid Waste Management, 24 (12): 18-21, December. Leachate produced by co-disposal of municipal and industrial wastes may not be very different from leachate produced from municipal waste alone.

Characterization of Soil Disposal System Leachates by Mason Tomson, et.al., may be available from the Municipal Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH 45268. Study shows many domestic septic tank effluents contain organics with the potential of impacting groundwater

Effect of Municipal Landfill Leachate on the Release of Toxic Metals from Industrial Wastes (1977) by M.J. Houle, et.al., Chemical Laboratory Division, U.S. Army, Dugway Proving Ground, Dugway, UT 84022. Demonstrates the potential hazard that may result from the disposing of certain industrial wastes together will municipal refuse.

Gas and Leachate from Landfills: Formation, Collection and Treatment (1976) by W.J. Dunlap, DC Shew, J.M. Robertson and C.R. Touissaint, USEPA 600/9-76-004. Organic pollutants contributed to groundwater by a landfill.

The Occurrence and Concentration of Organic Chemicals in Hazardous and Municipal Waste Landfill Leachate by K.W. Brown and K.C. Donnelly, Texas A & M University, Soil and Crop Sciences Department College Station, TX 77843. This paper evaluates the risk to human health and the environment from exposure in groundwater contaminated with municipal waste landfill leachates in 58 landfills.

Leachate from Co-Disposal of Municipal and Hazardous Waste in Landfill Simulators by Kinnman et.al. (March 1982). Prepared in cooperation with SCS Engineers, Covington, Kentucky.

Detection of Trace Organics in Well Water Near a Solid Waste Landfill by Foppe B. DeWalle and Edward S.K. Chian, in Journal of American Water Works Association, (March, 1981). Evaluates the migration of leachate containing trace contaminants away from a solid waste landfill located upstream from an artesian well operated by a local water company.

"Monitoring Toxic Chemicals in Land Disposal Sites" by William H. Walker, in Pollution Engineering, 6(9): 50-53, September 1974, Technical Publishing Company.

## Resource Recovery

Final Report: Evaluation of Municipal Solid Waste Incineration, St. Paul, MN: Minnesota Pollution Control Agency.

Municipal Waste Combustion Study: Report to Congress; NTIS # PB87-206074. $18.95. Prepared by Office of Solid Waste and Emergency Response USEPA, 401 M Street, SW, Washington, DC 20460.

New Developments in Spray Dryer Absorption of Household Incinerator Flue Gas. Presented at International Recycling Congress. Berlin. October 29-31, 1986.

Public Health, Public Fears: How to Communicate Risk. Laura C. Green, Vice President for Environmental Health and Toxicology, Meta Systems, Inc. Presented at the NSWMA Conference, September 9-11, 1987, Boston, MA.

Burning Trash: How it Could Work. Article by Allen Hershkowitz in Technology Review, July 1987.

## Waste Characterization

Waste Characterization Study: Assessment of Recyclable and Hazardous Components by David C. Bomberger. Prepared by SRI International for the California Waste Management Board, 1020 Ninth Street, Suite 300, Sacramento, CA 95814. DRAFT REPORT. The study looks at hazardous waste in solid waste landfills from a quanitative and toxicological standpoint.

Comprehensive Waste Characterization on a Quarterly Basis: (1985) Cal Recovery Systems, Inc. This study provides detailed composition analysis of MSW. Variations due to seasonality were taken into account. Studies were done in the Northern Santa Clara County.

A Characterization of Hazardous Household Wastes in Marin County, California by W.L. Rathje, D.C. Wilson, and W.W. Hughes. (1987). A Report to the Association of Bay Area Governments by The Garbage Project, Bureau of Applied Research in Anthropology, University of Arizona, Tucson, AZ 85721.

Characterization and Impacts of Non-regulated Hazardous Waste in the Solid Waste in King County. (December 1985). Puget Sound Council of Governments. Cal-Recovery System, Inc. of Richmond, California for the Puget Sound Council of Governments, 216 1street Avenue South, Seattle, WA 98104, (216) 464-7090.

A Characterization of Household Solid Waste (1986) by W.L. Rathje, W.W. Hughes, D.C. Wilson, and D.E. Nelson. Published by the Garbage Project, University of Arizona, Tucson, AZ.

Franklin Associates Ltd. Characterization of Municipal Solid Waste in the U.S., 1960 to 2000. Final report EPA Contract # 68-01-7037 WA 349. July 1986.

Hazardous Household Waste Characteristics in Two Cities: Marin County, California and New Orleans, Louisiana (1985) by W.L. Rathje, D.C. Wilson and W.W. Hughes, Garbage Project, Bureau of Applied Research in Anthropology, University of Arizona, Tucson, AZ, (602) 621-6290

## Appendix VII

## Hazardous Household Substances List

HAZARDOUS HOUSEHOLD SUBSTANCES LIST (***DRAFT***; 6/87)
Washington State Dept. of Ecology Solid & Hazardous Waste Program & Center for Environmental Management, Tufts University

### TOXIC CATEGORY TABLE*

| Category | TLm$_{96}$ (Fish) or Aquatic (Fish) LC$_{50}$ (ppm) | Oral (RAT) LD$_{50}$ (mg/kg) | Inhalation (RAT) LC$_{50}$ (mg/L) | Dermal (Rabbit) LD$_{50}$ (mg/kg) |
|---|---|---|---|---|
| X | <.1 | <.5 | <.02 | 2 |
| A | .1 - 1 | .5 - 5 | .02 - .2 | 2 - 8 |
| B | 1 - 10 | 5 - 50 | .2 - 2 | 20 - 20 |
| C | 10 - 100 | 50 - 500 | 2 - 20 | 200 - 200 |
| D | 100-1000 | 500-5000 | 20-200 | 2000-20000 |

* From the Registry of Toxic Effects of Chemical Substances (Registry) (NIOSH)

Key:
** = many separate compounds
* = any member(s) of chemical family named
? = hazardous characteristic probable but not verified or inconsistent with other listings
n.o.s. = not otherwise specified

CATEGORIES
I. Automotive, Boat, Equipment Maintenance
II. Home and Household Maintenance
III. Paint Products
IV. Repair and Remodelling
V. Hobby, Pet and Recreation Products
VI. Personal Care Products
VII. Pesticides and Herbicides

| CATEGORY | PRODUCT | CHEMICAL | CAS# | TOXIC CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| | | N-Butyl Alcohol --see Butanol, n- | | | | | |
| | | PCB's --see Polychlorinated Biphenyls* | | | | | |
| | | Butyl Alcohol --see Butanol | | | | | |
| | | Rubber Solvent --see Petroleum Naphtha | | | | | |
| | | Dipyridyl --see Diquat | | | | | |
| | | Tripolyphosphate --see Sodium Tripolyphosphate | | | | | |
| | | Isopropyl Alcohol --see Isopropanol | | | | | |
| | | Vapona --see Dichlorvos | | | | | |
| | | Carbolic Acid --see Phenol | | | | | |
| | | Ammonia --see Ammonium Hydroxide | | | | | |
| | | Methyl Alcohol --see Methanol | | | | | |
| | | Ethyl Alcohol --See Ethanol | 111-46-6 | ? | | | |
| | | Diethylene Glycol | 107-21-1 | ? | | 73 | 71 |
| I | Antifreeze | Ethylene Glycol | 127-10-4 | X | | | |
| I | Antifreeze/Coolant | Tetrachloroethylene | 108-93-0 | | | | 1 |
| I | Auto Degreasers | Cyclohexanol | 8008-20-6 | ? | | | |
| I | Automotive Rubbing Compounds | Kerosene | 7664-93-9 | C | 1 | | |
| I | Automotive Rubbing Compounds | Sulfuric Acid | 7439-92-1 | X | | 1 | |
| I | Batteries | Lead | | ? | | | |
| I | Batteries, Automotive | Heavy Metal Contaminants* | 1319-77-3 | B | ? | 1 | 1 |
| I | Brake Fluid | Cresol | 107-06-2 | D | | | |
| I | Carburetor Cleaners | Ethylene Dichloride | 1310-58-3 | C | 1 | | |
| I | Carburetor Cleaners | Potassium Hydroxide | 7775-11-3 | C | | | 1 |
| I | Carburetor Cleaners | Sodium Chromate | 8052-41-3 | ? | 1 | | 1 |
| I | Carburetor Cleaners | Stoddard Solvent | 8030-30-6 | | | | |
| I | Convertible Top Dressing | Petroleum Naphtha* | 79-01-6 | C | | 73 | 1 |
| I | Convertible Top Dressing | Trichloroethylene | 75-09-2 | C | 1 | | 1 |
| I | Degreasers | Methylene Chloride | ------- | | | | |
| I | Degreasers | Diaminodiethylamine-2,2 | 1338-23-4 | B | | | |
| I | Fiberglass, Resin & Hardeners | Methyl Ethyl Ketone Peroxide | | | | | |
| I | Fiberglass, Resin & Hardeners | | | | | | |

2

| CATEGORY | PRODUCT | CHEMICAL | CAS# | TOXIC CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| I | Fiberglass, Resin & Hardeners | Cyclohexanone | 108-94-1 | D? | | | |
| I | Gasoline | Tetraethyl lead | 78-00-2 | A | | | 1 |
| I | Gasoline | Ethylene Dichloride | 107-06-2 | D | | 3 | 1 |
| I | Gasoline | Xylene | 1330-20-7 | C | | | |
| I | Gasoline | Ethylene Dibromide | 106-93-4 | C | | | 1 |
| I | Gasoline | Benzene | 71-43-2 | C | | 1 | 1 |
| I | Gasoline | Toluene | 108-88-3 | C | 1 | 1 | |
| I | Gasoline | Organic Phosphorous cmpds* | | | | | |
| I | Gasoline | Aminestamine derivatives* | ------- | | | | |
| I | Leaded Gasoline | Lead | 7439-92-1 | X | | 1 | |
| I | Lubricating Oil | Tricresyl Phosphate | 78-30-8 | D | 1 | | 1 |
| I | Lubricating Oil | Petroleum Distillates* | ------- | ? | | ?1 | |
| I | Lubricating Oil | Heavy Metal Contaminants* | | ? | | | 1 |
| I | Motor Fuel Additive | Butanol, iso | 78-83-1 | D | | | |
| I | Radiator Flushes, Acidic | Sodium Bisulfite | 7681-90-5 | D | 1 | | |
| I | Radiator Flushes, Acidic | Boric Acid | 10043-35-3 | ? | 1 | | |
| I | Radiator Flushes, Acidic | Oxalic Acid | 144-62-7 | | 1 | | 1 |
| I | Radiator Flushes, Acidic | Hydrochloric Acid | 7647-01-0 | D | 1 | | 1 |
| I | Radiator Flushes, Acidic | Potassium Dichromate | 7778-50-9 | | 1 | 1 | 1 |
| I | Radiator Flushes, Acidic | Butanol, n- | 71-36-3 | D | | | 1 |
| I | Radiator Flushes, Acidic | Petroleum Ether* | 8032-32-4 | | | | 1 |
| I | Radiator Flushes, Acidic | Isopropanol | 67-63-0 | ? | | | |
| I | Radiator Flushes, Acidic | Olefins* | | | | | 1 |
| I | Radiator Flushes, Alkaline | Butanol, n- | 71-36-3 | D | | | |
| I | Radiator Flushes, Alkaline | Sodium Orthosilicate | ------- | | | | 1 |
| I | Radiator Flushes, Alkaline | Petroleum Ether* | 8032-32-4 | | | | 1 |
| I | Radiator Flushes, Alkaline | Isopropanol | 67-63-0 | ? | | | 1 |
| I | Radiator Flushes, Alkaline | Sodium Dichromate | 10588-01-9 | ? | 1 | 1 | 1 |
| I | Radiator Flushes, Alkaline | Potassium Dichromate | 7778-50-9 | | 1 | 1 | |
| I | Radiator Flushes, Alkaline | Sodium Tripolyphosphate | ------- | ? | 1 | | 1 |
| I | Radiator Flushes, Alkaline | Olefins* | | | 1 | | |
| I | Rust Inhibitor | Chromium | 7440-47-3 | X | | | 1 |
| I | Transmission Fluid | Stoddard Solvent | 8052-41-3 | ? | 1 | | 1 |
| I | Transmission Fluid | Petroleum Distillates* | ------- | ? | | | |
| I | Undercoatings | Phenolic Resin | ------- | | | | |
| I | Undercoatings | Heavy Metal Pigments* | ------- | | | | |
| I | Undercoatings | Alkyd Resin | ------- | | | | 1 |
| I | Undercoatings | Aromatic Hydrocarbons* | ------- | | | | |
| I | Undercoatings | Aliphatic Hydrocarbons* | ------- | | | | 1 |
| I | Windshield Washer Fluid | Isopropanol | 67-63-0 | ? | | | 1 |
| I | Windshield Washer Fluid | Methanol | 67-56-1 | D | | | |
| II | Air Cleaners | Cresol | 1319-77-3 | B | ? | | |
| II | Bleach | Oxalic Acid | 144-62-7 | | 1 | | |
| II | Bleach | Sodium Hypochlorite | 7681-52-9 | B | | | |
| II | Bleaches | Sodium Perborate | ------- | ? | 1 | | |
| II | Cleaning Solution, Fabric | Carbon Tetrachloride | 56-23-5 | C | | 1 | |
| II | Coffee Pot Cleaners | Sodium Perborate | ------- | ? | 1 | | |
| II | Coffee Pot Cleaners | Sodium Tripolyphosphate | ------- | ? | 1 | | |
| II | Concrete Cleaner | Phosphoric Acid | 7664-38-2 | D | 1 | | 1 |
| II | Concrete Cleaner | Isopropanol | 67-63-0 | ? | | | |
| II | Deck and Patio Cleaners | Phosphoric Acid | 7664-38-2 | D | 1 | | 1 |
| II | Degreasers | Dichlorobenzene, para- | 106-46-7 | B | ?1 | | |
| II | Degreasers | Chlorinated Solvents* | | | | 1 | |
| II | Degreasers | Dichlorobenzene, ortho- | 95-50-1 | B | | | 1 |
| II | Degreasers | Petroleum Distillates* | ------- | ? | | | |
| II | Degreasers | Methylene Chloride | 75-09-2 | C | | | |

3

| CATEGORY | PRODUCT | CHEMICAL | CAS# | TOXIC CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| II | Deodorizers | Paraformaldehyde | 30525-89-4 | C | 1 |  | 1 |
| II | Deodorizers | Dichlorobenzene, para- | 106-46-7 | B | ?1 |  | 1 |
| II | Deodorizers | Naphthalene | 91-20-3 | B | 1 |  | 1 |
| II | Deodorizers | Sodium Bisulfate | 7681-38-1 | D | 1 |  |  |
| II | Dishwasher Detergent | Sodium Tripolyphosphate | ------- | ? | 1 |  |  |
| II | Disinfectants | Cresol | 1319-77-3 | B | ? |  |  |
| II | Disinfectants | Sodium Hypochlorite | 7681-52-9 | B |  |  |  |
| II | Disinfectants | Formaldehyde | 50-00-0 | C |  | 1 | 1 |
| II | Disinfectants | Ammonium Hydroxide | 1336-21-6 | B | 1 |  |  |
| II | Drain Cleaner | Sulfuric Acid | 7664-93-9 | C | 1 |  |  |
| II | Drain Cleaners | Petroleum Distillates* | ------- | ? |  |  | 1 |
| II | Drain Cleaners | Dichlorobenzene, ortho- | 95-50-1 | B |  |  |  |
| II | Drain Cleaners | Trichloroethane-1,1,1 | 71-55-6 | C |  |  |  |
| II | Drain Cleaners | Potassium Hydroxide | 1310-58-3 | C | 1 |  |  |
| II | Drain Cleaners | Hydrochloric Acid | 7647-01-0 | D | 1 |  |  |
| II | Drain Cleaners | Sodium Hydroxide | 1310-73-2 | C | 1 |  |  |
| II | Fire Extinguishers | Carbon Tetrachloride | 56-23-5 | C |  | 1 |  |
| II | Fireplace Cleaners | Naphthalene | 91-20-3 | B | 1 |  | 1 |
| II | Fireplace Cleaners | Kerosene | 8008-20-6 | ? | ?1 |  | 1 |
| II | Fireplace Cleaners | Ethanol | 64-17-5 |  | 1 |  | 1 |
| II | Fireplace Cleaners | Ammonium Hydroxide | 1336-21-6 | B | 1 |  |  |
| II | Floor Cleaner | Diethylene Glycol | 111-46-6 | ? |  |  |  |
| II | Floor Cleaners | Ethylene Glycol | 107-21-1 | ? |  |  |  |
| II | Floor Cleaners and Waxes | Petroleum Distillates* | ------- | ? |  |  | 1 |
| II | Floor Cleaners and Waxes | Ammonium Hydroxide | 1336-21-6 | B | 1 |  |  |
| II | Floor Wax | Diethylene Glycol | 111-46-6 | ? |  |  |  |
| II | Floor Waxes | Ethylene Glycol | 107-21-1 | ? |  |  |  |
| II | Flourescent Lamp Ballast | Polychlorinated Biphenyls* | 1336-36-3 |  |  | 1 | 1 |
| II | Furniture Polish | Oil of Cedarwood | ------- | ? |  |  |  |
| II | Furniture Polish | Nitrobenzene | 98-95-3 | C |  |  | 1 |
| II | Household Cleaner | Sodium Dodecylbenzenesulfonate | 25155-30-0 | C |  |  |  |
| II | Household Cleaner | Sodium Tripolyphosphate | ------- | ? | 1 |  |  |
| II | Household Degreasers | Perchloroethylene | 127-18-4 | C |  | 1 |  |
| II | Laundry Products | Tetrachloroethylene | 127-18-4 | X |  |  |  |
| II | Laundry Products | Sodium Tripolyphosphate | ------- | ? | 1 |  |  |
| II | Mercury Batteries | Mercuric Oxide | ------- | ? |  | 1 |  |
| II | Metal Polish | Oxalic Acid | 144-62-7 |  | 1 |  |  |
| II | Metal Polishes | Phosphoric Acid | 7664-38-2 | D | 1 |  |  |
| II | Mothballs | Dichlorobenzene, mixed | 25321-22-6 | B |  |  |  |
| II | Mothballs | Naphthalene | 91-20-3 | B | 1 |  | 1 |
| II | Oven Cleaners | Potassium Hydroxide | 1310-58-3 | C | 1 |  |  |
| II | Oven Cleaners | Methylene Chloride | 75-09-2 | C |  |  |  |
| II | Oven Cleaners | Sodium Hydroxide | 1310-73-2 | C | 1 |  |  |
| II | Oven Cleaners | Trichloroethylene-1,1,1 | 79-01-6 | C |  |  |  |
| II | Polishes | Isopropanol | 67-63-0 | ? |  |  | 1 |
| II | Polishes | Petroleum Distillates* | ------- | ? |  |  | 1 |
| II | Polishes | Ethanol | 64-17-5 | ? |  |  |  |
| II | Propylene Dichloride | Propylene Dichloride | 78-87-5 | C |  |  |  |
| II | Refrigerant | Dichloro-diflouromethane | 75-71-8 | D |  |  |  |
| II | Rug Cleaner | Trichloroethane,1,1,2 | 79-00-5 | X |  |  |  |
| II | Rug Cleaners | Naphthalene | 91-20-3 | B | 1 |  | 1 |
| II | Septic Tank Cleaners | Trichloroethane-1,1,1 | 71-55-6 | C |  |  |  |
| II | Septic Tank Cleaners | Methylene Chloride | 75-09-2 | C |  |  |  |
| II | Septic Tank Cleaners | Dichlorobenzene, mixed | 25321-22-6 | B |  |  |  |
| II | Septic Tank Cleaners | Petroleum Distillates* | ------- | ? |  |  | 1 |
| II | Septic Tank Cleaners | Trichloroethylene | 79-01-6 | C |  | 1 |  |

| CATEGORY | PRODUCT | CHEMICAL | CAS# | TOXIC CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| II | Shoe Care Products | Nitrobenzene | 98-95-3 | C | | | 1 |
| II | Shoe Products | Trichloroethane,1,1,2 | 79-00-5 | X | | | |
| II | Smoke Detectors | Mercury | 7439-97-6 | X | | 1 | |
| II | Spot Removers | Trichloroethane,1,1,2 | 79-00-5 | C | | 1 | |
| II | Spot Removers | Ammonium Hydroxide | 1336-21-6 | ?C | | | |
| II | Spot Removers | Sodium Hypochlorite | 7681-52-9 | B | | | |
| II | Spot Removers | Perchloroethylene | 127-18-4 | C | | 1 | |
| II | Toilet Bowl Cleaner | Sodium Sulfate | ------- | | 1 | | |
| II | Toilet Bowl Cleaner | Sodium Oxalate | ------- | ? | 1 | | |
| II | Toilet Bowl Cleaners | Dichlorobenzene, para- | 106-46-7 | B | ?1 | | 1 |
| II | Toilet Bowl Cleaners | Oxalic Acid | 144-62-7 | | 1 | | |
| II | Toilet Bowl Cleaners | Hydrochloric Acid | 7647-01-0 | D | 1 | | 1 |
| II | Window Cleaner | Diethylene Glycol | 111-46-6 | ? | | | |
| II | Window Cleaners | Trisodium Phosphate (decahydrate) | 10361-89-4 | | 1 | | |
| II. | Smoke detectors, ionization | Americium-241 | ------- | ? | | ? | |
| III | Brush Cleaners | Benzene | 71-43-2 | C | | 1 | 1 |
| III | Brush Cleaners | Xylene | 1330-20-7 | C | | | 1 |
| III | Brush Cleaners | Kerosene | 8008-20-6 | ? | ?1 | | 1 |
| III | Brush Cleaners | Toluene | 108-88-3 | C | 1 | 1 | 1 |
| III | Paint Remover | Butanol, iso | 78-83-1 | ? | | | 1 |
| III | Paint Strippers | Sodium Hydroxide | 1310-73-2 | C | 1 | | |
| III | Paint Strippers | Perchloroethylene | 127-18-4 | C | | 1 | |
| III | Paint Thinner | Toluene | 108-88-3 | C | 1 | 1 | 1 |
| III | Paint Thinners | Dichlorobenzene, ortho- | 95-50-1 | B | | | |
| III | Paint and Varnish Removers | Bis(2-chloroethyl)ether | 111-44-4 | X | | 1 | 1 |
| III | Paintbrush Cleaner | Trisodium Phosphate (decahydrate) | 10361-89-4 | | 1 | | |
| III | Paints | Cadmium Metal | 7440-43-9 | X | | | |
| III | Shellac and Resin Thinners | Methyl Isobutyl Ketone | 108-10-1 | D | | | 1 |
| III | Solvent Based Paints | Mineral Spirits | ------- | | 1 | 1 | |
| III | Solvent Based Paints | Butanol, n- | 71-36-3 | D | | ?1 | |
| III | Solvent Based Paints | Petroleum Naphtha* | 8030-30-6 | | 1 | 1 | |
| III | Solvent Based Paints | Methyl Ethyl Ketone | 78-93-3 | D | | 1 | |
| III | Solvents | Petroleum Naphtha* | 8030-30-6 | | 1 | 1 | |
| III | Solvents | Turpentine | 8006-64-2 | | ?1 | ?1 | 1 |
| III | Solvents | Cresol | 1319-77-3 | B | ? | | |
| III | Solvents | Petroleum Ether* | 8032-32-4 | | ?1 | ?1 | 1 |
| III | Solvents | Xylene | 1330-20-7 | C | | | 1 |
| III | Solvents | Isopropanol | 67-63-0 | ? | | | 1 |
| III | Solvents | Mineral Spirits | ------- | | 1 | 1 | |
| III | Strippers | Butanol, n- | 71-36-3 | D | | | 1 |
| III | Strippers | Trichloroethane-1,1,1 | 71-55-6 | C | | | |
| III | Strippers | Methylene Chloride | 75-09-2 | C | 1 | | 1 |
| III | Strippers | Acetone | 67-64-1 | D | | | 1 |
| III | Varnishes, Shellacs, Lacquers | Ethanol | 64-17-5 | | | | 1 |
| III | Varnishes, Shellacs, Lacquers | Ethyl Acetate | 141-78-6 | D | | | 1 |
| III | Varnishes, Shellacs, Lacquers | Urethane Alkyds | ------- | | | | |
| III | Varnishes, Shellacs, Lacquers | Butyl Acetate, n- | 123-86-4 | D | | | 1 |
| III | Varnishes, Shellacs, Lacquers | Acetone | 67-64-1 | D | | | 1 |
| III | Varnishes, Shellacs, Lacquers | Ethyl Carbamate | 51-79-6 | A | | 1 | |
| III | Water Based Paints | Chromium | 7440-47-3 | X | | | |
| III | Water Based Paints | Butadiene | 106-99-0 | A | 1 | 1 | |
| III | Water Based Paints | Cuprous Oxide | ------- | ? | | | |
| III | Water Based Paints | Styrene Monomer | 100-42-5 | C | | ?1 | 1 |
| III | Water Based Paints | Zinc Oxide | 1314-13-2 | | | | |
| III | Water Based Paints | Iron Oxide | SEQ 00-17-7 | | | | |
| III | Water Based Paints | Ethylene Glycol | 107-21-1 | ? | 1 | 1 | |

5

| CATEGORY | PRODUCT | CHEMICAL | CAS# | CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| III | Wood Preservative | Chromium | 7440-47-3 | X | | | |
| III | Wood Preservative | Pentachlorophenol | 87-86-5 | A | | | |
| III | Wood Preservatives | Arsenic | 7440-38-2 | X | | | |
| III | Wood Stains | Lead | 7439-92-1 | X | | 1 | |
| III | Wood Stains | Benzene | 71-43-2 | C | | 1 | 1 |
| III | Wood Stains | Methanol | 67-56-1 | D | | | 1 |
| IV | Adhesives and Glues | Petroleum Spirits* | ------- | | 1 | | 1 |
| IV | Adhesives and Glues | Isopropanol | 67-63-0 | ? | | | 1 |
| IV | Adhesives and Glues | Methyl Ethyl Ketone | 78-93-3 | D | | | 1 |
| IV | Adhesives and Glues | Toluol | 108-88-3 | C | 1 | | 1 |
| IV | Adhesives and Glues | Urea Formaldehyde | 68611-64-3 | C | 1 | | 1 |
| IV | Adhesives and Glues | Toluene | 108-88-3 | C | 1 | 1 | 1 |
| IV | Adhesives and Glues | Methylene Chloride | 75-09-2 | C | 1 | | 1 |
| IV | Caulking Compounds | Phenol | 108-95-2 | C | 1 | | 1 |
| IV | Caulking Compounds | Lead | 7439-92-1 | ?A | | 1 | |
| IV | Caulking Compounds | Kerosene | 0008-20-6 | ? | ?1 | | 1 |
| IV | Caulking Compounds | Xylene | 1330-20-7 | C | ?1 | | 1 |
| IV | Caulking Compounds | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Drywall Matls., Tiles, Cements | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Electrical Insulation | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Fireproofing Materials | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Furnace Cement | Sodium Silicate | ------- | | 1 | | |
| IV | Furnace Cement | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Insulation | Urea Formaldehyde | 68611-64-3 | C | 1 | | 1 |
| IV | Joint Compounds, Dry | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Roof Coatings | Glycol Ethers* | 111-46-6 | | 1 | | 1 |
| IV | Roof Coatings | Petroleum Distillates* | ------- | ? | ?1 | | 1 |
| IV | Roofing Shingles | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Sealants | Styrene Monomer | 100-42-5 | C | 1 | ?1 | 1 |
| IV | Sealants | Polyester Resins | ------- | | 1 | | |
| IV | Sealants | Epoxy Resins | ------- | | 1 | | 1 |
| IV | Stove Lining | Asbestos | 1332-21-4 | X | | 1 | |
| IV | Stove Lining | Borax | ------- | | | | |
| IV | Thermal Insulation | Asbestos | 1332-21-4 | X | | 1 | |
| IV | White Lead Putties | Asbestos | 1332-21-4 | X | | 1 | |
| IV | White Lead Putties | Lead | 7439-92-1 | X | | 1 | |
| IV | Wood Putty | Toluene | 108-88-3 | C | 1 | 1 | 1 |
| V | Acids | Acetic Acid | 64-19-7 | D | | | |
| V | Acids | Tannic Acid | 1401-55-4 | | 1 | | |
| V | Acids | Chromic Acid | 11115-74-5 | C | | | |
| V | Aerosols | Petroleum Distillates* | ------- | ? | | | 1 |
| V | Aerosols | Heavy Metal Based Pigments* | | ? | | 1 | |
| V | Aerosols | Toluene | 108-88-3 | C | 1 | 1 | 1 |
| V | Aerosols | Butane | 106-97-8 | | | | 1 |
| V | Aerosols | Propane | 74-98-6 | | | | 1 |
| V | Aerosols | Ketones* | | | | | 1 |
| V | Aerosols | Chlorinated Hydrocarbons* | | | | 1 | |
| V | Alcohols | Butanol, iso | 78-83-1 | D | | | 1 |
| V | Alcohols | Isopropanol | 67-63-0 | ? | | | 1 |
| V | Alcohols | Benzyl Alcohol | 100-51-6 | | | | |
| V | Artist's Paint "Cobalt Violet" | Cobalt Arsenate | ------- | ? | | | |
| V | Bottled Gas | White Gas* | ------- | | | | |
| V | Bottled Gas | Propane | 74-98-6 | | | | 1 |
| V | Bottled Gas | Acetylene Gas | 74-86-2 | | | | |
| V | Chemistry Sets | ** | | | | | |
| V | Dyes | Heavy Metal Based Pigments* | | ? | | 1 | |

6

| CATEGORY | PRODUCT | CHEMICAL | CAS# | TOXIC CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| V | Flea Powder | Carbaryl (Sevin) | 63-25-2 | B | | | |
| V | Flea Powder | Dichlorophene | ------- | ? | | | |
| V | Flea Powder | Chlordane | 57-74-9 | X | | | |
| V | Glazes | Heavy Metal Based Pigments* | | ? | | 1 | |
| V | Glues | Methyl Acetate | 79-20-9 | ? | | | |
| V | Glues and Cements | Methyl Methacrylate | 80-62-6 | D | | | 1 |
| V | Glues and Cements | Camphor | 76-22-2 | ? | | | 1 |
| V | Glues and Cements | Borax | ------- | | | | |
| V | Glues and Cements | Petroleum Naphtha | 8030-30-6 | | | | 1 |
| V | Glues and Cements | Petroleum Distillates* | ------- | ? | | | 1 |
| V | Glues and Cements | Alcohols, n.o.s.* | 64-17-5 | | | | 1 |
| V | Glues and Cements | Mineral Spirits | ------- | | | | 1 |
| V | Glues and Cements | Hexane | 110-54-3 | | | | 1 |
| V | Glues and Cements | Acetone | 67-64-1 | D | | | 1 |
| V | Glues and Cements | Ethylene Glycol | 107-21-1 | ? | | | |
| V | Glues and Cements | Benzene | 71-43-2 | C | | 1 | 1 |
| V | Glues and Cements | Methyl Acetate | 79-20-9 | | | | 1 |
| V | Glues and Cements | Ammonium Hydroxide | 1336-21-6 | B | 1 | | |
| V | Glues and Cements | Formaldehyde | 50-00-0 | C | | 1 | 1 |
| V | Hobby Acid Solutions | Sulfuric Acid | 7664-93-9 | C | 1 | | |
| V | Hobby Acids | Phenol | 108-95-2 | | | | |
| V | Hobby Acids | Nitric Acid | 7697-37-2 | C | 1 | | |
| V | Hobby Paint & Varnish Removers | Carbon Tetrachloride | 56-23-5 | C | | 1 | |
| V | Hobby Solvents | Isoamyl Alcohol | 123-51-3 | | | | 1 |
| V | Hobby Solvents | Methanol | 67-56-1 | D | | | 1 |
| V | Hobby Solvents and Thinners | Mineral Spirits | ------- | | | | 1 |
| V | Hobby Solvents and Thinners | Petroleum Distillates* | ------- | ? | | | 1 |
| V | Hobby Solvents and Thinners | Cabitol | ------- | | | | |
| V | Hobby Solvents and Thinners | Petroleum Naphtha | 8030-30-6 | | | | 1 |
| V | Hobby Solvents and Thinners | Carbon Disulfide | 75-15-0 | D | | | 1 |
| V | Hobby Solvents and Thinners | Phenol | 108-95-2 | C | | | |
| V | Hobby Solvents and Thinners | Cellosolve | 110-80-5 | | | | 1 |
| V | Hobby Solvents and Thinners | Tetrachloroethylene | 127-18-4 | X | | ?1 | |
| V | Hobby Solvents and Thinners | Chlorotoluene, ortho | 95-49-8 | | | | 1 |
| V | Hobby Solvents and Thinners | Trichloroethylene | 79-01-6 | C | | 1 | |
| V | Hobby Solvents and Thinners | Ethylene Glycol | 107-21-1 | ? | | | |
| V | Hobby Solvents and Thinners | Carbon Tetrachloride | 56-23-5 | C | | 1 | |
| V | Hobby Solvents and Thinners | Methyl Cellosolve | 109-84-4 | | | | 1 |
| V | Hobby Solvents and Thinners | Cellosolve Acetate | 111-15-9 | | | | 1 |
| V | Hobby Solvents and Thinners | Butyl Acetate, n- | 123-86-4 | D | | | 1 |
| V | Hobby Solvents and Thinners | Ethyl Acetate | 141-78-6 | D | | | 1 |
| V | Hobby Solvents and Thinners | Carbon Disulfide | 75-15-0 | D | | | 1 |
| V | Hobby Solvents and Thinners | Nitrobenzene | 98-95-3 | C | | | 1 |
| V | Hobby Solvents and Thinners | Methyl Chloroform | 71-55-6 | C | | | |
| V | Hobby Solvents and Thinners | Lithotine | ------- | | | | 1 |
| V | Hobby Waxes | Carbon Tetrachloride | 56-23-5 | C | | 1 | |
| V | Inks | Ethylene Glycol | 107-21-1 | ? | | | |
| V | Inks | Acetic Acid | 64-19-7 | D | | | |
| V | Inks | Heavy Metal Based Pigments* | | ? | | 1 | |
| V | Inks | Chromic Acid | 11115-74-5 | C | | 1 | |
| V | Inks | Aromatic Hydrocarbons* | ------- | | | 1 | 1 |
| V | Inks | Diethylene Glycol | 111-46-6 | ? | | | |
| V | Inks | Sulfuric Acid | 7664-93-9 | C | 1 | | |
| V | Paint and Varnish Removers | Phenol | 108-95-2 | C | 1 | | 1 |
| V | Paint and Varnish Removers | Methanol | 67-56-1 | D | | | 1 |
| V | Paint and Varnish Removers | Isophorone | 78-59-1 | D | | | |

7

| CATEGORY | PRODUCT | CHEMICAL | CAS# | CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| V | Paint and Varnish Removers | Xylene | 1330-20-7 | C | | | 1 |
| V | Paint and Varnish Removers | Isoamyl Alcohol | 123-51-3 | | | | 1 |
| V | Paint and Varnish Removers | Toluene | 108-88-3 | C | 1 | 1 | 1 |
| V | Paint and Varnish Removers | Cyclohexanone | 108-94-1 | D | | | 1 |
| V | Paint and Varnish Removers | Methylene Chloride | 75-09-2 | C | | | |
| V | Paint and Varnish Removers | Cresol | 1319-77-3 | B | ? | | |
| V | Paint and Varnish Removers | Methyl Isobutyl Ketone | 108-10-1 | D | | | 1 |
| V | Paint and Varnish Removers | Butanol, iso | 78-83-1 | D | | | 1 |
| V | Paint and Varnish Removers | Vinyl Toluene | 25013-15-4 | | | | 1 |
| V | Paint and Varnish Removers | Acetone | 67-64-1 | D | | | 1 |
| V | Paint and Varnish Removers | Benzene | 71-43-2 | C | | 1 | 1 |
| V | Paint and Varnish Removers | Methyl Styrene, alpha | 98-83-9 | | | | 1 |
| V | Paint and Varnish Removers | Styrene Monomer | 100-42-5 | C | | ?1 | 1 |
| V | Paint and Varnish Removers | Methyl Ethyl Ketone | 78-93-3 | D | | | 1 |
| V | Paint and Varnish Removers | Alkali, Concentrated* | SEQ NO-0-6 | | 1 | | |
| V | Paints | Heavy Metal Based Pigments* | | ? | | 1 | |
| V | Photography Chemicals | Potassium Permanganate | 7722-64-7 | B | | | |
| V | Photography Chemicals | Potassium Oxalate | ------- | | | | |
| V | Photography Chemicals | Potassium Dichromate | 7778-50-9 | | | | |
| V | Photography Chemicals | Platinum Chloride | 10025-65-7 | | | | |
| V | Photography Chemicals | Potassium Chrome Alum | ------- | C | | | |
| V | Photography Chemicals | Acetic Acid | 64-19-7 | D | | | |
| V | Photography Chemicals | Potassium Cyanide | 151-50-8 | A | | | |
| V | Photography Chemicals | Catechin | ------- | | | | |
| V | Photography Chemicals | Uranium Nitrate | 36478-76-9 | | | ? | |
| V | Photography Chemicals | Ferricyanide | ------- | ? | | | |
| V | Photography Chemicals | Tertiary Butylamine Borane | ------- | | | | |
| V | Photography Chemicals | Hydrochloric Acid | 7647-01-0 | D | | | |
| V | Photography Chemicals | Sulfuric Acid | 7664-93-9 | C | 1 | | |
| V | Photography Chemicals | Iodine | 7553-56-2 | | | | |
| V | Photography Chemicals | Sodium Thiosulfate | ------- | | | | |
| V | Photography Chemicals | Oxalic Acid | 144-62-7 | | 1 | | |
| V | Photography Chemicals | Sodium Hypochlorite | 7681-52-9 | B | | | |
| V | Photography Chemicals | Potassium chlorochromate | ------- | | | | |
| V | Photography Chemicals | Sodium Hydroxide | 1310-73-2 | C | 1 | | |
| V | Photography Chemicals | Diaminophynol Hydrochloride | ------- | | | | |
| V | Photography Chemicals | Sodium Dichromate | 10588-01-9 | ? | 1 | 1 | 1 |
| V | Photography Chemicals | Hydroxylamine Sulfate | 10046-00-1 | | | | |
| V | Photography Chemicals | Sodium Carbonate | ------- | | | | |
| V | Photography Chemicals | Phenylenediamine, para- | 106-50-3 | | | | |
| V | Photography Chemicals | Selenium Oxide | 7446-08-4 | C | | | |
| V | Photography Chemicals | Formaldehyde | 50-00-0 | C | | 1 | 1 |
| V | Photography Chemicals | Ammonium Hydroxide | 1336-21-6 | B | 1 | | |
| V | Photography Chemicals | Mercuric Chloride | 7487-94-7 | | | | |
| V | Photography Chemicals | Pyrogallic Acid | ------- | | | | |
| V | Solvents and Thinners | Ethylene Dichloride | 107-06-2 | D | | 1 | 1 |
| V | Solvents and Thinners | Petroleum Ether* | 8032-32-4 | | | | 1 |
| V | Solvents and Thinners | Dioxane | 123-91-1 | X | | 1 | 1 |
| V | Solvents and Thinners | Perchloroethylene | 127-18-4 | C | | 1 | |
| V | Solvents and Thinners | Alcohols, n.o.s.* | 64-17-5 | | | | 1 |
| V | Solvents and Thinners | Methylene Chloride | 75-09-2 | C | | | |
| V | Solvents and Thinners | Chloroform | 67-66-3 | D | | 1 | |
| V | Solvents and Thinners | Ketones* | | | | | 1 |
| V | Solvents and Thinners | Turpentine | 8006-64-2 | | | | 1 |
| V | Solvents and Thinners | Phenol | 108-95-2 | C | 1 | | 1 |
| V | Solvents and Thinners | Kerosene | 8008-20-6 | ? | | | 1 |

8

| CATEGORY | PRODUCT | CHEMICAL | CAS# | TOXIC CAT | CAUSTIC | CARCIN | IGNIT |
|---|---|---|---|---|---|---|---|
| V | Solvents and Thinners | Petroleum Naphtha* | 8030-30-6 | | | | 1 |
| V | Solvents and Thinners | Dichlorobenzene, mixed | 25321-22-6 | B | | | |
| V | Solvents and Thinners | Isoamyl Acetate | 123-92-2 | | | | 1 |
| V | Solvents and Thinners | Cutting Oils* | SEQ NO-36-1 | | | | |
| V | Solvents and Thinners | Diethylene Glycol | 111-46-6 | ? | | | |
| V | Solvents and Thinners | Cyclohexane | 110-82-7 | C | | | 1 |
| V | Solvents and Thinners | Aromatic Hydrocarbons* | ------- | | | 1 | 1 |
| V | Varnishes and Lacquers | Alcohols, n.o.s.* | 64-17-5 | | | | 1 |
| V | Varnishes and Lacquers | Aromatic Hydrocarbons* | ------- | | | 1 | 1 |
| V | Varnishes and Lacquers | Petroleum Distillates* | ------- | ? | | | 1 |
| V | Waxes | Benzene | 71-43-2 | C | | 1 | 1 |
| V | Waxes | Ether | ------- | | | | 1 |
| V | Waxes | Polychlorinated Biphenyls* | 1336-36-3 | | | 1 | 1 |
| V | Waxes | Acetone | 67-64-1 | D | | | 1 |
| V | Waxes | Turpentine | 8006-64-2 | | | | 1 |
| V | Waxes | Alcohols, n.o.s.* | 64-17-5 | | | | 1 |
| V | Wood Stains | Ethanol | 64-17-5 | | | | 1 |
| VI | Denture Cleaners | Sodium Perborate | ------- | ? | 1 | | |
| VI | Nail Polish & Remover | Butyl Acetate, n- | 123-86-4 | D | | | 1 |
| VI | Nail Polish Remover | Ethyl Acetate | 141-78-6 | D. | | | 1 |
| VI | Nail Polish Removers | Benzene | 71-43-2 | C | | 1 | 1 |
| VI | Nail polish & remover | Acetone | 67-64-1 | D | | | 1 |
| VI | Rubbing Alcohol | Isopropanol | 67-63-0 | ? | | | 1 |
| VI | Rubbing Alcohol | Methanol | 67-56-1 | D | | | 1 |
| VI | Thermometers | Mercury | 7439-97-6 | X | | 1 | |
| VII | Crawling Insect Killer (powder) | Chlordane | 57-74-9 | X | | | |
| VII | Herbicides | Diquat | 85-00-7 | C | | | |
| VII | Herbicides | Paraquat | 1910-42-5 | | | | |
| VII | Pesticides | Carbaryl (Sevin) | 63-25-2 | B | | | |
| VII | Pesticides | Diazinon | 333-41-5 | X | | | |
| VII | Pesticides & Herbicides | Dichlorvos (DDVP) | 62-73-7 | A | | | |
| VII | Pesticides and Herbicides | Arsenic | 7440-38-2 | X | | | |